Class 540

Book No. 16467

Northeastern University

Library

Law Division

BULLETIN
OF THE
NATIONAL RESEARCH COUNCIL

Vol. 9, Part 3

March 1925

Number 50

BIBLIOGRAPHY OF BIBLIOGRAPHIES ON CHEMISTRY
AND CHEMICAL TECHNOLOGY
1900-1924

Compiled for Research Information Service

BY

CLARENCE J. WEST

*Associate Editor, International Critical Tables,
National Research Council*

AND

D. D. BEROLZHEIMER

*Consulting Bibliographer,
Woodmere, N. Y.*

CONTENTS

	PAGE
INTRODUCTION	3
SERIALS AND GENERAL WORKS SEARCHED.....	7
PART I. GENERAL BIBLIOGRAPHIES.....	9
PART II. ABSTRACT JOURNALS AND YEAR BOOKS.....	12
PART III. GENERAL INDEXES OF SERIALS.....	15
PART IV. BIBLIOGRAPHIES ON SPECIAL SUBJECTS.....	19
PART V. PERSONAL BIBLIOGRAPHIES.....	304

116

9

11

11000

11000

INTRODUCTION

"Chemical literature is the storehouse of the available published information of chemical science and chemical industry." The data on any given subject may be and usually are scattered through a great number and a wide variety of books, serials, and so forth, which fact has led to the compilation of lists of references, more or less complete, on various phases of chemistry. As a rule, these lists, or bibliographies, are not issued as separate publications but are found as footnotes or appendixes to books and to articles in the various scientific publications. Although a few of these lists may be located through abstract journals or through the bibliographical entries on the Library of Congress cards, most of them are not to be discovered by consulting the ordinary sources of information available to the research worker. This fact, it is believed, fully justifies the present compilation.

This work is the third of a series of collective bibliographies, the preparation of which has been undertaken by the Research Information Service of the National Research Council. The first of these deals with geology (Edward B. Mathews, *Catalogue of Published Bibliographies in Geology, 1896-1920*. Bulletin of the National Research Council, No. 36, *i. e.*, Vol. 1, pt. 5, 1923); the second covers the field of physics (Karl K. Darrow, *Classified List of Published Bibliographies in Physics, 1910-1922*. Bulletin of the National Research Council, No. 47, *i. e.*, Vol. 8, pt. 4, 1924). Many bibliographies of interest to the chemist and chemical engineer, whose work often takes them far from the realms of pure chemistry, will be found in the above named publications for, in general, the entries of the one are not reproduced in the other. There is, however, some duplication in the present compilation. The chemist is interested in the occurrence of mineral and metal deposits, a field which primarily belongs to geology; and manufacturing operations, properties and uses of minerals and metals are often covered by bibliographies occurring in geological literature. Such topics as radioactivity, isotopes, surface tension, etc., are equally important to the chemist and physicist; bibliographies covering both aspects of these subjects may be found in this work as well as in the compilation on physics, although the purely physical aspects of these topics will be found in Darrow's compilation only.

It must be emphasized that this compilation is in no sense a complete list of published bibliographies on chemistry and chemical technology, even for the period indicated. In such a complete bibliography every known chemical

compound, every property of those compounds and every chemical process might properly be considered an entry. Many of these have so little interest that their inclusion is not justified. Again, bibliographies on chemical and related subjects may be found in practically every known serial; in many cases to discover a single bibliography would involve the searching of many hundred printed pages. For the purpose of this compilation it was felt that the results thus obtained would not be commensurate with the time required for the search. Few bibliographies appearing before 1900 have been included because it is believed that references to such lists will be found in the publications herein listed.

Part I includes the few general bibliographies which could not be conveniently classified under the special subject headings in Part IV because of the collective nature of the references included.

Part II contains a list of general abstract journals and year books dealing with chemistry. Those publications covering a specialized field of chemistry will be found under the proper subject entry in Part IV. In each case an effort has been made to indicate the scope of the field covered, so that an investigator interested in a special field of chemistry may know which of the various publications will give him the most information.

Part III gives a partial list of the collective indexes of serials which have been published. It is felt that the simple form of entry which has been adopted (that is, giving the inclusive volumes and years covered by the index) will give all the needed information; no effort has been made to reproduce the title page of each index. A list of technical indexes and bibliographies appearing serially was issued by the Carnegie Library of Pittsburgh in 1910.

Part IV is devoted to the listing of bibliographies on special subjects. In this section a straight alphabetical arrangement by subjects has been used. Under each subject the entries are arranged alphabetically. The liberal use of cross references has made it possible to avoid the repetition of individual entries. With but few exceptions, the number of entries under each subject is sufficiently small so that the reader will have no difficulty in finding a bibliography on a particular phase of the subject. In this section an effort has been made to distinguish between two general types of bibliographies. Those entries in which the word "footnotes" is used contain bibliographic data as footnotes, the name of the author and the place of publication being the only information given; those in which the word "references" is used indicate that the entries are collected at the end of the article and that the title of each reference is given and in addition the author's name and the place of publication. No systematic attempt has been made to give the number of footnotes or references. This information has been included in those entries where the footnotes or references have been numbered consecutively.

Part V contains a list of those personal bibliographies which have come to the attention of the compilers during their searches. It is in no sense complete, as special effort was not made to trace such bibliographies.

It is hoped that those who use this work and who have references to bibliographies not listed herein will forward them to the compilers. If a sufficient number of these are collected they may be published as a supplement to the present work.

It is a pleasure to make the following acknowledgments: Mr. J. David Thompson, Director of the Research Information Service, for his continued interest and counsel; Mr. Harrison E. Craver, Director of the Engineering Societies Library, for placing at our disposal the facilities of his library; Dr. Glenn V. Brown, Bucknell University, who made available to us his collection of bibliographies; Dr. Jerome Alexander, who checked the list of bibliographies on Adhesives, Gelatin and Glue; Dr. C. A. Browne, who checked the list of bibliographies on Alchemy; Dr. H. V. Arny, who checked the bibliographies on Alkaloids and Pharmacy.

CLARENCE J. WEST
D. D. BEROLZHEIMER

March 1, 1925.

LIST OF SERIALS AND GENERAL WORKS SEARCHED

(The standard abbreviations adopted by Chemical Abstracts have been used throughout this compilation.)

- Abderhalden, Emil. Biochemisches Handlexikon, vols. 1-10 (1911-1923).
 Abderhalden, Emil. Handbuch der biologischen Arbeitsmethoden, parts 1-116 (1921-1924).
 Abegg, R., and Auerbach, Fr. Handbuch der anorganischen Chemie, vols. 2-4 (in 6 parts) (1906-1921).
 Abstracts of Bacteriology, vols. 1-7 (1917-1923).
 American Chemical Journal, vols. 23-50 (1900-1913).
 American Journal of Botany, vols. 1-9 (1914-1922).
 American Journal of Public Health, vols. 1-12 (1911-1922).
 Annalen der Chemie, Justin Liebig's, vols. 310-340 (1900-1924).
 Annali di chimica applicata, vols. 1-12 (1914-1918).
 Annals of the Missouri Botanical Gardens, vols. 1-8 (1912-1921).
 Archiv für die gesamte Physiologie des Menschen und der Tiere, vols. 125-193 (1900-1922).
 Archiv der Pharmacie, vols. 238-259 (1900-1922).
 Archives of Internal Medicine, vols. 1-29 (1908-1922).
 Arkiv för Kemi, Mineralogi och Geologi, vols. 1-7 (1914-1920).
 Barker, Lewellyn F. Endocrinology and Metabolism, vols. 1-5 (1922). Vol. 5 is a general bibliography and index.
 Biochemical Bulletin, vols. 1-5 (1910-1915).
 Biochemisches Zentralblatt, vols. 1-8 (1902-1910).
 Botanical Gazette, vols. 49-73 (1910-1922).
 British Association for the Advancement of Science. Reports. 1900-1923.
 British Association for the Advancement of Science. *Chemical Section*. Reports on Colloid Chemistry and its General Industrial Applications Nos. 1-5 (1917-1923).
 Bulletin de la société chimique de Belgique, vols. 23-31 (1909-1922).
 Bulletin de la société chimique de France, ser. 3, vol. 23, ser. 4, vol. 35 (1900-1924).
 Bulletin of the Imperial Institute, vols. 1-22 (1903-1924).
 Bulletin of the National Research Council, vols. 1-6 (1919-1924).
 Caliche, vols. 1-3 (1919-1922).
 Chemical and Metallurgical Engineering, vols. 1-30 (1902-1924).
 Chemiker-Zeitung, vols. 24-48 (1900-1924).
 Chemische Umschau auf dem Gebiete der Fette, Oele, Wasche und Harze, vols. 9-29 (1902-1922).
 Chemische Zeitschrift, vols. 1-5 (1901-1906).
 Chimie & Industrie, vols. 1-10 (1919-1923).
 Doelter, C. Handbuch der Mineralchemie, vols. 1-3 (in 5 parts) (1912-1921).
 Edel-Erzen und -Erde, vols. 1-2 (1920-1921).
 Elektrochemische Zeitschrift, vols. 7-26 (1901-1920).
 Endocrinology, vols. 1-7 (1917-1923).
 Ergebnisse der Physiologie, vols. 1-22 (1902-1923).
 Experiment Station Record, vols. 19-48 (1907-1923).
 Fortschritte der Chemie, Physik und physikalischen Chemie, vols. 1-17 (1909-1923).
 Fortschritte der Mineralogie, Kristallographie und Petrographie, vols. 1-7 (1911-1922).
 Frémy, E. Encyclopédie chimique (1882-1905).
 Friend, J. Newton. A Textbook of Inorganic Chemistry. To be issued in 10 volumes. (Those appearing up to 1925 have been covered).
 Gesammelte Abhandlungen zur Kenntniss der Kohle, vols. 1-6 (1917-1921).
 Giornale di chimica industriale ed applicata, vols. 1-4 (1919-1922).
 Glückauf, Berg- und Hüttenmännische Zeitschrift, vols. 44-56 (1908-1920).
 Gmelin-Kraut's Handbuch der anorganischen Chemie. 7th ed., edited by C. Friedheim. Vols. 1-5 (in 10 parts) (1906-1915).
 Helvetica Chimica Acta, vols. 1-7 (1918-1924).
 Ion, vols. 1-2 (1908-1910).

- Iron and Steel Institute (London), Carnegie Scholarship Memoirs, vols. 1-13 (1909-1924).
- Jahrbuch der Radioaktivität und Elektronik, vols. 1-17 (1905-1921).
- Journal für praktische Chemie, vols. 61-108 (1900-1924).
- Journal of Agricultural Research, vols. 1-27 (1913-1924).
- Journal of Bacteriology, vols. 1-5 (1916-1920).
- Journal of Biological Chemistry, vols. 1-60 (1905-1924).
- Journal of Dairy Science, vols. 1-6 (1918-1923).
- Journal of General Physiology, vols. 1-7 (1918-1924).
- Journal of Hygiene, vols. 1-18 (1901-1918).
- Journal of Industrial and Engineering Chemistry, vols. 1-16 (1909-1924).
- Journal of Laboratory and Clinical Medicine, vols. 1-7 (1916-1922).
- Journal of Metabolic Research, vols. 1-3 (1922-1924).
- Journal of the American Ceramic Society, vols. 1-7 (1918-1924).
- Journal of the American Chemical Society, vols. 22-46 (1900-1924).
- Journal of the American Leather Chemists' Association, vols. 1-19 (1906-1924).
- Journal of the American Pharmaceutical Association, vols. 1-13 (1912-1924).
- Journal of the American Society of Agronomy, vols. 1-16 (1909-1924).
- Journal of the Franklin Institute, vols. 150-197 (1900-1924).
- Journal of the Institute of Metals, vols. 1-31 (1909-1924).
- Journal of the Institution of Petroleum Technologists, vols. 1-10 (1915-1924).
- Journal of the Society of Chemical Industry, vols. 19-43 (1900-1924).
- Journal of the Society of Glass Technology, vols. 1-7 (1916-1923).
- Kolloidchemische Beihefte, vols. 1-12 (1909-1923).
- Kolloid-Zeitschrift, vols. 1-28 (1906-1921).
- Mellor, J. W. A Comprehensive Treatise on Inorganic and Theoretical Chemistry, vols. 1-5 (1922-1924).
- Meyer, Victor, and Jacobsen, Paul. Lehrbuch der organischen Chemie, vols. 1-2 (1902-1924).
- Moissan, H. Traité de chimie minérale (1904-1906).
- Naturwissenschaften, vols. 1-12 (1913-1924).
- Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, vols. 30-45 (1910-1921).
- Oppenheimer, Carl. Handbuch der Biochemie des Menschen und der Tiere, vols. 1-5 (1909-1913). Part of the 2nd ed. has been issued.
- Paper, vols. 1-36 (1910-1924).
- Paper Trade Journal, vols. 71-79 (1920-1924).
- Philippine Journal of Science, vols. 1-22 (1906-1924).
- Physiological Reviews, vols. 1-4 (1921-1924).
- Recueil des travaux chimiques des Pays-Bas, vols. 34-43 (1915-1923).
- Soil Science, vols. 1-16 (1916-1923).
- Surgeon General's Office, Index Catalogue, ser. 1, vols. 1-12; ser. 2, vols. 1-14; ser. 3, vols. 1-4 (1880-1924).
- Transactions of the American Ceramic Society, vols. 1-19 (1898-1917).
- Transactions of the American Electrochemical Society, vols. 1-46 (1902-1924).
- Transactions of the American Institute of Chemical Engineers, vols. 1-15 (1908-1924).
- Transactions of the American Institute of Metals, vols. 1-12 (1907-1918).
- Transactions of the American Institute of Mining and Metallurgical Engineers, vols. 32-69 (1901-1923).
- Transactions of the American Society for Steel Treating, vols. 1-4 (1920-1924).
- Transactions of the Faraday Society, vols. 1-17 (1905-1922).
- United States, Bureau of Mines, Bulletins Nos. 1-214 (1910-1924).
- United States, Bureau of Mines, Technical Papers Nos. 1-364 (1911-1924).
- United States, Bureau of Standards, Bulletin, vols. 1-19 (Scientific Papers 1-489) (1904-1924).
- United States, Bureau of Standards, Technologic Papers Nos. 1-257 (1911-1924).
- United States, Department of Agriculture, Bureau of Chemistry, Bulletin, Nos. 85-147 (1904-1912).
- United States, Geological Survey, Professional Papers Nos. 1-135 (1902-1924).
- Zeitschrift für angewandte Chemie, vols. 13-37 (1900-1924).
- Zeitschrift für anorganische und allgemeine Chemie, vols. 29-131 (1900-1923).
- Zeitschrift für Elektrochemie, vols. 7-29 (1900-1923).
- Zeitschrift für Untersuchungen der Nahrungs- und Genussmittel, vols. 13-30 (1907-1915).
- Zeitschrift für physikalische Chemie, vols. 32-100 (1900-1922).

PART I. GENERAL BIBLIOGRAPHIES

(*See also* general headings in Part IV, such as Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry.)

- BARROWS, FRANK E. Investigation of the chemical literature. *Chem. Met. Eng.* 24: 423-428, 477-479, 517-521 (1921). Discussion of general reference works.
- BIBLIOGRAPHICA CHEMICA. Internationaler Literatur-Anzeiger für Chemie, chemische Technologie und alle Grenzgebiete. Berlin, Verlag Chemie, G. M. B. H. Vol. 1 appeared in 1922. Contains a classified list of books and a list of papers appearing in current German publications.
- BOLTON, HENRY C. A select bibliography of chemistry, 1492-1892. *Smithsonian Misc. Coll. Pub. No. 850.* 1893. 1212 p. First supplement, 1492-1897. *Pub. No. 1170.* 1899. 489 p. Second supplement, 1492-1902. *Pub. No. 1253.* 1904. 462 p. Section VIII. Academic dissertations. *Pub. No. 1253.* 1901. 534 p.
- BOLTON, HENRY C. Bibliography of chemistry for the years 1880-1888. In *Smithsonian Institution, Annual Repts.*, 1880: 289-297; 1881: 381-390; 1882: 509-531; 1883: 629-659; 1884: 491-542; 1885: 637-686; 1887: 387-447; 1888: 425-453.
- BRITISH SCIENCE GUILD. A catalogue of British scientific and technical books, covering every branch of science and technology, carefully selected and indexed. London, 1921. 376 p. Chemistry, p. 122-135; applied and industrial chemistry, p. 136-151.
- BROWN, RAYMOND N. Recent technical bibliographies. *Special Libraries* 15: 32-37, 58-61 (1924). Contains many references to chemistry and technical subjects. Covers principally 1922-1923.
- CHEMICAL SOCIETY, London. *Library.* A catalogue of the library of the chemical society, arranged according to authors, with a subject index. London, Gurney, 1903. 324 p. Earlier catalogues were issued in 1850, 1861, 1869, 1874, 1886.
- CHEMIKER-VEREIN, Hamburg. *Sammel-katalog der in Hamburger öffentlichen Bibliotheken vorhandenen Literatur aus der Chemie und aus verwandten Wissenschaften.* Hamburg, Boysen, 1901. 108 p.
- CHEMICAL ENGINEERING CATALOG. Technical and scientific books section. In 9th. ed., p. 968-1079. 1924. Arranged by authors with subject index. Practically complete list of books in English dealing with chemistry and chemical engineering.
- CHEMISCHE NOVITÄTEN. Bibliographische Monatsschrift für die neuerscheinende Literatur auf dem Gesamtgebiet der reinen und angewandten Chemie und der chemischen Technologie. Leipzig, Foch, 1904-. The first four volumes contain 5340 book titles.
- COURTNEY, WM. P. A register of national bibliography. London, Constable, 1905. 2 vols. 631 p. Bibliographies are classified by subject, with author index. References are to books only. Chemistry, p. 110-112. *See also* special headings through the work.
- CRANE, WALTER M. Index of mining engineering literature, comprising an index of mining, metallurgical, civil, mechanical, electrical and chemical engineering subjects as related to mining engineering. New York, Wiley, 1909-1912. 2 vols. Chemistry, p. 35-45 and 20-27. Clays, p. 53-55 and 29-30. Fuels, p. 316-328 and 209-214. Concrete, p. 99-105 and 46-48. Metals, p. 579-583 and 345-346. Minerals p. 583-593 and 346-348.
- ENGINEERING INDEX, 1884-1905. New York, Engineering magazine, 1892-1906. 4 vols. An alphabetical subject index, with no author index, to about 250 technical and engineering periodicals. Continued as an annual publication.
- ENGINEERING INDEX ANNUAL, 1906-1924. New York, Engineering magazine, 1907-1918. *Am. Soc. Mech. Eng.*, 1919-1924. 1 vol. a year, cumulating monthly issues in *Mechanical Engineering*. Contains many references of chemical and chemical engineering interest.
- ESCHER, P. Observations on chemical bibliographies. *Chem. Bull.* 7: 43-45, 73-77 (1920).

- FUCHS, GEORG F. C. Repertorium der chemischen Literatur von 494 von Christi Geburt bis 1806, in chronologischer Ordnung aufgestellt. Jena, 1806-1811. 2 vols. 648 and 694 p.
- GLENN, EARL R. Chemistry references for students and teachers. Columbia Univ., Lincoln School of Teachers College, 1921. 5 p.
- GT. BRITAIN. *Patent office*. Subject list of works on chemistry (including alchemy, electrochemistry and radioactivity) in the Patent Office. 1911. 200 p.
- HAMOR, W. A., *et al.* Chemical reading courses prepared by the committees on the preparation of a recommended list of chemical texts for libraries. *J. Ind. Eng. Chem.* 12: 701-705, 806-807 (1920).
- HELVETICA CHIMICA ACTA. "Liste bibliographique des travaux de chimie faits en Suisse." 1918- . Published in each number.
- HERRERO DUCLOUX, ENRIQUE. Los estudios quimicos en la Republica Argentina, 1810-1910. Buenos Aires, Coni Hermanos, 1912. 431 p. *Bibl.*, p. 38-431.
- INDUSTRIAL ARTS INDEX. Subject index to a selected list of engineering and trade periodicals. 1913-1924. New York, Wilson, 1913-1925. Indexes mainly material in English, but from 1919 on includes some foreign journals. Material classified by subjects. Contains much of chemical and chemical engineering interest.
- INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE. Section D, Chemistry. Annually from 1901-1914. Primary divisions: General, specific chemistry of the elements, laboratory processes, organic chemistry, analytical chemistry, chemistry of manufacturing processes, theoretical and physical chemistry, physiological chemistry, agricultural chemistry. Section C deals with physics; G with mineralogy and crystallography, Q with physiological chemistry and pharmacology; R with bacteriological chemistry.
- The German titles for this work were published under the title: "Bibliographie der deutschen naturwissenschaftlichen Literatur" and cover the period 1901-1914; the French titles appeared in: "Bibliographie scientifique française mensuel," and cover 1901-1918.
- JOHN CRERAR LIBRARY. A list of bibliographies on special subjects. Chicago, 1902. 504 p. Chemistry, p. 168-183; chemical technology, p. 347-359.
- JORISSEN, W. P., *et al.* Chemisch Jaarboekje. Tevens Jaarboekje der Nederlandsche Chemische Vereeniging. Deel III. 1920. Amsterdam, Centen, 1920. "Boekenlijst," p. 176-650. Classified by subject with an author index. Covers the entire field of chemistry and its applications.
- MENSHUTKIN, B. N. [Russian chemical bibliography for 1917 and 1918.] *J. Russ. Phys. Chem. Soc.* 51, pt. 2: 1-22 (1920).
- NEWARK FREE PUBLIC LIBRARY. Chemistry; books and periodicals relating to chemistry in all its aspects, especially in its industrial applications and the marketing of chemicals and chemical products. Newark, 1921. 15 p. Classified.
- NEW YORK PUBLIC LIBRARY. Selected list of books on engineering, industrial arts and trades. New York, 1913. 81 p. Sanitary engineering, p. 34-37; metallurgy, p. 38-40; chemical technology, p. 48-52; textile industries, p. 52-54; foundry practice, p. 63-65; paper manufacture, p. 65-66.
- REPERTORIUM der technischen Journal Literatur, hrsg. im Kaiserlichen Patentamt, 1874-1909. Berlin, Heymann, 1875-1909. 35 vols. A subject index to more than 400 periodicals, arranged alphabetically by the German word followed, in vols. from 1892 on, by the French and English equivalents. Each volume has a detailed subject index to this subject list; vols. from 1897 on have an author index also.
- This is a continuation of a similar compilation by F. SCHUBARTH, covering the years 1823-1853 (Berlin, 1856. 1049 p.) and by BRUNO KERL, covering the years 1854-1868 (Leipzig, 1871-1878). It was continued in *Fortschritte der Technik*, of which only 2 vols. were issued, covering 1910-1911.
- RUPRECHT, RUD. Bibliotheca chemica et pharmaceutica. . . . 1858 bis ende 1870. Göttingen, 1872. 125 p. Continuation of Zuchold's Bibliotheca (*v. infra*).
- SOHON, JULIAN A., and SCHAAF, WM. L. A reference list of bibliographies: Chemistry, chemical technology and chemical engineering since 1900. New York, Wilson, 1924. 100 p.
- SPARKS, MARION E. Chemical literature and its use; notes of a course of lectures. 2d ed. Urbana, Ill., 1921. 80 p.
- STEIN, HENRI. Manuel de bibliographie générale (Bibliotheca bibliographica nova). Paris, Picard, 1897. 895 p. Chemistry, p. 148-152; hygiene, p. 229-230; pharmacology, p. 234-235.

- TROMMSDORFF, JOHANN B. Versuch einer systematischen Darstellung der gesamten chemischen Literatur, oder Verzeichniss der in das Gebiet der Chemie gehörenden Schriften welche von Anfang 1800 bis zum Schluss des Jahres 1894, in Deutschland, England, Amerika, Frankreich, Holland, Schweden, Dänemark und Italien wirklich erschienen sind. *In his* Allgemeine chemische Bibliothek der neunzehnten Jahrhundert, vol. 5, pt. 1: 93-200.
- RECUEIL DES TRAVAUX CHIMIQUES DES PAYS-BAS. "Bibliographie primaire des ouvrages et des essais originaux chimiques néerlandaises ou écrites par des néerlandais." Published in each number.
- U. S. SURGEON-GENERAL'S OFFICE. *Library*. Index-catalogue of the library of the Surgeon-General's office, United States Army. Authors and subjects. Washington, Govt. print. off., 1880- . 1st ser., 1880-1895; 2nd ser., 1896-1916; 3rd ser., 1918- . Contains much of interest to the biological chemist, pharmacologist, etc.
- WEIGEL, CHRISTIAN E. Grundriss der reinen und angewandten Chemie. Zum Gebrauch akademischer Vorlesungen. Greifswald, 1777. 2 vols. Classified bibl.; alphabetical list of authors and their writings.
- WEST, CLARENCE J., and HULL, CALLIE. Manuscript bibliographies in chemistry and chemical technology. *J. Ind. Eng. Chem.* 14: 1075-1078, 1148-1151 (1922). National Research Council, Reprint and Circular Series, No. 36. 17 p.
- YOUNG, JAMES. *Bibliotheca chimica*; a catalogue of the alchemical, chemical and pharmaceutical books in the collection of the late James Young of Kelly and Durris. Glasgow, Maclehose, 1906. 2 vols.
- ZEITLINGER, H., and SOTHERAN, H. C. *Bibliotheca chemico-mathematica*. Catalogue of works in many tongues on exact and applied sciences, with a subject index. 2 vols. London, Sotheran, 1921.
- ZUCHOLD, ERNST A. *Bibliotheca chemica*. Verzeichniss der auf dem Gebiete der reinen, pharmaceutischen, physiologischen und technischen Chemie in den Jahren 1840 bis Mitte 1858 in Deutschland und im Auslande erschienenen Schriften. Göttingen, Vandenhoeck, 1859. Continued by Ruprecht's *Bibliotheca* (*v. supra*).

PART II. ABSTRACT JOURNALS AND YEAR BOOKS

- ANALES DE LA SOCIEDAD ESPAÑOLA DE FÍSICA Y QUÍMICA. Since 1912 (vol. 10) each volume consists of two parts; the second part contains abstracts and reviews.
- BERICHTE der deutschen chemischen Gesellschaft. Vols. 1-29 (1868-1896) contained abstracts (Referate) paged separately. Discontinued when the Society acquired the *Chemisches Centralblatt*.
- BULLETIN DE LA SOCIÉTÉ CHIMIQUE DE FRANCE. 1858-. Since 1892 the abstracts have been segregated and fill even-numbered vols. Classified under the headings: General, mineral, organic, biological, analytical.
- BULLETIN OF THE IMPERIAL INSTITUTE. Each number contains "Recent progress in agriculture and the development of natural resources," classified under the headings: Agriculture, soils, food-stuffs, oils and oil seeds, essential oils, rubber, fibers, forestry, tanning materials, economic minerals.
- CHEMICAL ABSTRACTS. 1907-. In 1922, 1010 serials were abstracted; they cover practically every chemical journal as well as those in the related fields of engineering, biology, medicine, geology, etc. Chemical patents of all countries are covered. New books are listed with review notices. The abstracts are classified under 30 heads: Apparatus; general and physical chemistry; sub-atomic phenomena and radiochemistry; electrochemistry; photography; inorganic chemistry; analytical chemistry; mineralogical and geological chemistry; metallurgy and metallography; organic chemistry; biological chemistry; foods; general industrial chemistry and chemical engineering; water, sewage and sanitation; soils, fertilizers and agricultural poisons; fermentation industries; pharmaceutical chemistry; acids, alkalis, salts and sundries; glass, clay products, refractories and enameled metals; cement and other building materials; fuels, gas, tar and coke; petroleum, asphalt and wood products; cellulose and paper; explosives and explosions; dyes and textile chemistry; paints, varnishes and resins; fats, fatty oils and soaps; sugar, starch and gums; leather and glue; rubber and allied substances.
- CHEMICAL SOCIETY. Annual reports on the progress of chemistry. London. 1904-. The object of these reports is to present an epitome of the principal steps in advance which have been accomplished in the preceding year. The material is classified under the following sections: General and physical chemistry; inorganic chemistry; organic chemistry—aliphatic, homocyclic and heterocyclic divisions; analytical chemistry; agricultural chemistry and vegetable physiology; crystallography and metallurgy; radioactivity.
- CHEMISCHES REPERTORIUM. Beilage der Chemiker Zeitung. "Uebersicht über das Gesamtgebiet der reinen und angewandten Chemie." 1896-. Classified as follows: History, laboratory; physical chemistry; inorganic chemistry; mineralogy; general analysis; organic chemistry; chemistry of plants and animals, agricultural chemistry; foods and feedingstuffs; bacteriology, disinfection; pharmacy; hygiene; apparatus; fuels; lighting and heating; water; fertilizers; glass, ceramics; gases, dry distillation, tar products; petroleum, asphalt, explosives; organic preparations; sugar, starch, dextrin; fermentation industry; tannins; oils, fats, soaps; varnishes, resins, rubber; terpenes and ethereal oils; fibers, cellulose, paper; dyes and dyeing; iron; metals; photochemistry and photography; electrochemistry.
- CHEMISCH-TECHNISCHEN MITTHEILUNGEN. Edited by L. Elsner. 1846-1875 (?). Covers both inorganic and organic chemistry.
- CHEMISCHES ZENTRALBLATT. Vollständiges Repertorium für alle zweige der reinen und angewandte Chemie. 1830-. (Pharmaceutisches Centralblatt, 1830-1850; Chemisch-Pharmaceutisches Centralblatt, 1850-1956; in 1919 the scope of the journal was enlarged to include technical chemistry, the abstracts being published simultaneously in *Zeitschrift für angewandte Chemie*.) At present the scientific section covers: General chemistry; physical chemistry; inorganic chemistry; mineralogical and geological chemistry; organic chemistry; biochemistry—plant chemistry, plant physiology, bacteriology, animal chemistry, animal physiology,

- physiology and pathology of the body constituents. The technical section covers: Analysis; laboratory; general chemical technology; water; inorganic chemistry; fertilizers and soils; metallurgy and metallography; organic preparations; dyes; resins, lakes, inks; glues; rubber; sugar, starches, etc.; fermentation industries; foods; fats, waxes, soaps; fibers and spinning materials, paper, cellulose; fuels; explosives; pharmacology, disinfection; photography.
- CHIMIE & INDUSTRIE, 1919-. The abstracts are classified as follows: Physical chemistry; organic chemistry; analytical chemistry; apparatus; combustion; heating and lighting; water; laboratory equipment; mining and metallurgy; industrial chemistry; electrochemistry; nitrogen and its compounds; lime, cement, etc.; ceramics and glass; dyes; photography; rubber; oils, fats and waxes; paints, varnishes, etc.; plastics and artificial textiles; foods; sugar; tanning; cellulose; essential oils; explosives; pharmaceuticals; radioactivity; industrial hygiene; refrigeration; fuels; patents.
- EXPERIMENT STATION RECORD, 1892-. Since 1911, the subject index carries a heading "bibliography," which includes a reference to each bibliography mentioned in the text. The headings of chemical interest are: Agricultural chemistry; soils; fertilizers; foods; human nutrition; dairying.
- JAHRBUCH DER CHEMIE; Bericht über die wichtigsten Fortschritte der reinen und angewandten Chemie. 1891-. The following classification is used: Inorganic; organic; physiological; pharmaceutical; foods; agriculture; fuels; explosives; metallurgy; sugar; fermentation; fats; dyes; fibers; photography; physical chemistry; selected topics.
- JAHRBUCH DER ELEKTROCHEMIE und angewandten physikalischen Chemie. 1894-1907. Abstracts classified under the headings: Scientific and industrial; heterogeneous equilibria; homogeneous equilibria; reaction velocity and catalysis; photochemistry; electrical conductivity; chemical and electrical energy; polarization and electrolysis; radioactivity; colloids; accumulators; organic compounds; electroplating; technical applications of mass action law; inorganic electrochemistry; alkali chlorides; electrolysis.
- JAHRBUCH der Erfindungen und Fortschritte an dem Gebieten der physikalischen Chemie, Technologie, etc. 1865-1901. Edited by Hirzel, Gretschel, and others.
- JAHRESBERICHT über die Fortschritte der Chemie und Mineralogie. 1822-1849. Edited by Jacob Berzelius.
- JAHRESBERICHT über die Fortschritte der reinen, pharmaceutischen und technischen Chemie, Physik, Mineralogie und Geologie. (Liebig and Kopp.) 1847-1910. This work is divided into inorganic and organic sections; the material is classified under the usual headings for those fields. References are in the form of footnotes.
- JAHRESBERICHT über die Fortschritte auf dem Gebiete der reinen Chemie. 1873-1881 (?). Edited by Wilhelm Staedel. Classified.
- JAPANESE JOURNAL OF CHEMISTRY, 1921-. Published in English and gives abstracts of all papers appearing in Japanese journals.
- JOURNAL OF THE CHEMICAL SOCIETY. 1870-. The abstract section was separated in 1878 (vol. 34); it was divided into two parts in 1893 (vol. 64). Part I contains: Organic chemistry; physiological chemistry; chemistry of vegetable physiology and agriculture. Part II contains: General and physical chemistry; inorganic chemistry; mineralogical chemistry; analytical chemistry.
- JOURNAL OF THE SOCIETY OF CHEMICAL INDUSTRY. 1882-. The classification used in 1923 follows: General, plant, machinery; fuels, gas, mineral oils and waxes; destructive distillation, heating, lighting; tar and tar products; coloring matters and dyes; fibers, textiles, cellulose, paper; bleaching, dyeing, finishing, printing; acids, alkalis, salts, non-metallic elements; glass, ceramics; building materials; metals, metallurgy, including electrometallurgy; electrochemistry; fats, oils, waxes; paints, varnishes, pigments, resins; india rubber, gutta-percha; leather, bone, horn, glue; soils, fertilizers; sugar, starches, gums; fermentation industries; foods; water purification, sanitation; organic products, medicinal substances, essential oils; photographic materials and processes; explosives, matches; analysis.
- PHYSIKALISCH-CHEMISCHES CENTRALBLATT. 1903-1909 (?).
- REVIEW OF AMERICAN CHEMICAL RESEARCH. 1895-1906. Vols. 1-7 formed a part of the Technology Quarterly. Continued as Chemical Abstracts.
- RÉPERTOIRE GÉNÉRALE DE CHIMIE PURE ET APPLIQUÉE. 1899-1918. Covers the entire field of chemistry under the

headings: Apparatus, general and physical, inorganic, organic (various sub-headings used), analytical, vegetable, pharmaceutical, biological, bacteriological, metabolism, etc.

For abstract journals and year books dealing with special fields of chemistry consult the following topics in Part IV: AGRICULTURAL CHEMISTRY, ANALYTICAL CHEMISTRY, BIOCHEMISTRY, BOTANICAL CHEMISTRY, BREWING, CELLULOSE, CERAMICS, COLLOIDS, CRYSTAL-

LOGRAPHY, ELECTROCHEMISTRY, FATS, FERMENTATION, FOODS, FUELS, INDUSTRIAL CHEMISTRY, INORGANIC CHEMISTRY, LEATHER, METALLURGY, MINERALOGY, ORGANIC CHEMISTRY, PAPER, PEAT, PETROLEUM, PHARMACOLOGY, PHARMACY, PHOTOGRAPHY, PHYSICAL CHEMISTRY, PHYSIOLOGICAL CHEMISTRY, RADIUM AND RADIOACTIVITY, RUBBER, SANITATION, SOILS, SUGAR, TEXTILES, WATER.

PART III. GENERAL INDEXES OF SERIALS

- American Chemical Journal. 1-10 (1879-1888); 11-20 (1889-1898); 21-50 (1889-1913).
- American Journal of Pharmacy. 43-52 (1871-1880); 53-62 (1881-1890).
- American Journal of Physiology. 1-30 (1898-1912); 31-60 (1912-1922).
- American Journal of Science. Ser. 1, 1-49 (1819-1845) in vol. 50; ser. 2, 1-10 (1846-1850); 11-20 (1851-1855); 21-30 (1856-1860); 31-40 (1861-1865); 41-50 (1866-1870); ser. 3, 1-10 (1871-1875); 11-20 (1876-1880); 21-30 (1881-1885); 31-40 (1886-1890); 41-50 (1891-1895); ser. 4, 1-10 (1896-1900); 11-20 (1901-1905); 21-30 (1906-1910); 31-40 (1911-1915); 41-50 (1916-1920).
- Analyst. 1-20 (1877-1896); 21-30 (1896-1905); 31-40 (1906-1915).
- Annalen der Chemie, Justus Liebig's. 1-100 (1832-1856); 101-116 (1857-1860); 117-164, suppl. vols. 1-8 (1861-1872); 165-220 (1873-1883); 221-276 (1884-1893); 277-328 (1893-1903); 329-380 (1903-1911); 381-430 (1912-1923).
- Annalen der Physik. 1-15 (1877-1891); 16-30 (1892-1906); 31-43 (1907-1919).
- Annalen der Physik und Chemie (Continuation of Annalen der Physik und der physikalische Chemie, vols. 77-236 edited by Poggendorff, n. s., 1-69, edited by Widemann). 1-120, Ergänzungsband 2-4 (1799-1877); 1-150 (author only); 121-150 (subject only); 1-160, Ergänzungsband 1-8, Jubelband der Poggendorffschen Folge, 1824-1877 (subject only); 151-160, n. s. 1-50 (1877-1893) (subject only); 51-69 (1894-1899); 1-30 (1900-1909).
- Annalen der Physik und der physikalische Chemie (Continuation of Annalen der Physik, 1799-1819); vols. 1-62 known as Gilbert's Annalen der Physik). 1-76 (1799-1824). Continued as Annalen der Physik und Chemie.
- Annales d'hygiène publique et de médecine légale. Ser. 3, 1-50 (1879-1903).
- Annales de chimie et de physique. 1-30 (1789-1799); 31-60 (1799-1806); 61-96 (1807-1815); (published as vols. 97-99); ser. 2, 1-30 (1816-1825); 31-60 (1826-1835); 61-78 (1836-1840); ser. 3, 1-30 (1841-1850); 31-69 (1851-1863); ser. 4, 1-30 (1864-1873); ser. 5, 1-30 (1874-1883); ser. 6, 1-30 (1884-1893); ser. 7, 1-30 (1894-1903).
- Annales des Mines. Ser. 1, 1-28 (1795-1810); ser. 1-2, 39-59 (1816-1830); ser. 3, 60-79 (1832-1841); ser. 4, 80-99 (1842-1851); ser. 5, 100-119 (1852-1861); ser. 6, 120-139 (1862-1871); ser. 7, 140-159 (1872-1881); ser. 8, 160-179 (1882-1891); ser. 9, 180-199 (1892-1901); ser. 10, 200-219 (1902-1911).
- Annals of Botany. 1-10 (1887-1896); 11-20 (1897-1906); 21-30 (1907-1916).
- Archiv für die gesamte Physiologie des Menschen und der Tiere. 1-30 (1868-1883); 31-70 (1883-1898); 71-140 (1898-1911).
- Archiv für experimentelle Pathologie und Pharmacologie. 1-50 (1873-1903); 51-60 (1903-1909) in vol. 61; 61-70 (1909-1913) in vol. 71; 71-80 (1913-1916) in vol. 81.
- Archiv für Hygiene. 1-10 (1883-1890); 1-40 (1883-1901).
- Archiv für pathologische Anatomie und Physiologie und für klinische Medizin (Virchow). 1-100 (1847-1885); 101-110 (1885-1887) in vol. 110; 110-120 (1887-1890) in vol. 120; 121-130 (1890-1895) in vol. 130; 131-140 (1892-1895) in vol. 140; 141-150 (1895-1897) in vol. 150; 151-160 (1898-1900) in vol. 160; 161-170 (1900-1902) in vol. 170; 171-180 (1902-1905) in vol. 180; 150-200 (1898-1910) in vol. 200; 201-210 (1910-1912) in vol. 210; 211-220 (1912-1915) in vol. 220.
- Archief voor de Suikerindustrie in Nederlandsch-Indie. 1893-1902; 1893-1912.
- Archiv der Pharmacie. 1-130 (1822-1857); 143-203 (1858-1873).
- Astrophysical Journal. 1-25 (1895-1907).
- Atti della R. Accademia di scienze in Padova. 1779-1900.
- Berichte der deutschen chemischen Gesellschaft. 1-10 (1868-1877); 11-20 (1878-1887); 21-29 (1888-1896); 30-40 (1897-1907); 41-50 (1908-1917).
- Berichte von Schimmel und Co. 1910-1914.
- Biedermann's Centralblatt für Agriculturchemie und rationellen Landwirthschaftsbetrieb. 1-25 (1872-1896).
- Biochemical Journal. 1-10 (1907-1916).
- Biochemische Zeitschrift. 1-30 (1906-1911); 31-60 (1911-1914); 61-90 (1914-1918); 91-120 (1918-1921).
- Botanical Abstracts. 1-10 (1918-1922).

- Botanische Centralblatt. 1-60 (1880-1896).
- British Association for the Advancement of Science. 1831-1860; 1861-1890.
- Bulletin de l'académie royale des sciences, des lettres et des beaux-arts de Belgique. Ser. 1, 1-23 (1832-1856); ser. 2, 1-20 (1857-1866); 21-50 (1867-1880); ser. 3, 1-30 (1881-1895).
- Bulletin de la société chimique de France. 1858-1874; 1875-1888; 1889-1898; 1899-1906.
- Bulletin de la société Française de minéralogie. 1-10 (1878-1887); 11-20 (1888-1897); 21-30 (1898-1907).
- Bulletin de pharmacie (et des sciences accessoires). 1-16 (1809-1830).
- Bulletin of the Bureau of Standards. 1-10 (1904-1914).
- Bulletin société industrielle de Mulhouse. 1-60 (1826-1890).
- Bulletin société industrielle de Rouen. 1-16 (1873-1888).
- Canada. Department of Mines. *Mines branch*. Catalog of publications of the Mines branch (1907-1911). *In its publication* No. 104. 1912.
- Canada. Geological Survey. Annotated catalogue of and guide to the publications of the Geological Survey, Canada. (1845-1917). *In its publication* no. 1723. 1920.
- Canada. Geological Survey. Reports of Progress. 1843-1852; 1863-1884; 1885-1906.
- Centralblatt für Agriculturchemie. *See* Biedermann.
- Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten. II. Abt. 1-10 (1895-1903); 11-20 (1903-1908); 21-30 (1908-1911); 31-40 (1911-1914).
- Chemical Abstracts. 1-10 (1907-1916).
- Chemical News. 1-100 (1806-1909).
- Chemisch-technischen Mittheilungen der neuesten Zeit. 1-20 (1846-1871) (subjects only).
- Chemisch-technisches Repertorium. Beilage zur Chemiker-Zeitung. 1-5 (1862-1866); 6-10 (1867-1871); 11-15 (1872-1876); 16-20 (1877-1881); 21-25 (1882-1886); 26-30 (1887-1891); 31-35 (1892-1896).
- Chemische Zentralblatt. Ser. 3, 1-12 (1870-1881); ser. 5, 1-5 (1897-1901); 6-10 (1902-1906); 11-15 (1907-1911); 16-20 (1912-1916); 21-25 (1917-1921).
- Comptes rendus hebdomadaires des séances de l'académie des sciences. 1-31 (1835-1850); 32-61 (1851-1865); 62-91 (1866-1880); 92-121 (1881-1895).
- Dinglers polytechnisches Journal. 1-78 (1820-1840); 79-118 (1841-1850); 119-158 (1851-1860); 159-198 (1861-1870).
- Elektrotechnische Zeitschrift. 1880-1902.
- Experiment Station Record. 1-12 (1889-1901); 13-25 (1901-1911).
- Gazzetta chimica italiana. 1-20 (1871-1890).
- Glückauf, Berg- und Hüttenmännische Zeitschrift. 31-40 (1895-1904).
- India Rubber Journal. 1-10 (1884-1894).
- Jahrbuch der Chemie. Bericht über die wichtigsten Fortschritte der reinen und angewandten Chemie. 1-10 (1891-1900).
- Jahrbuch für Mineralogie, Geologie und Paläontologie. 1830-1839; 1840-1849; 1850-1859; 1860-1869; 1870-1879; 1880-1884 and Beilagebände 1-2; 1885-1889 and Beilagebände 3-6; 1890-1894 and Beilagebände 7-8; 1895-1899 and Beilagebände 9-12; 1900-1904 and Beilagebände 13-20; 1905-1909 and Beilagebände 21-28.
- Jahresbericht über die Fortschritte auf dem Gesamtgebiete der Agricultur Chemie. 1-20 (1858-1877); 21-40 (1878-1897).
- Jahresbericht über die Fortschritte der Chemie und Mineralogie. 1-17 (1821-1837); 1-25 (1821-1845).
- Jahresbericht über die Fortschritte der Chemie und verwandter Teile anderer Wissenschaften. 1847-1856; 1857-1866; 1867-1876; 1877-1886; 1887-1896; 1897-1906.
- Jahresbericht über die Fortschritte der Tierchemie. 1-10 (1871-1880); 11-20 (1881-1890); 21-30 (1891-1900); 31-40 (1901-1910).
- Jahresbericht über die Leistungen der chemischen Technologie. 1-10 (1855-1864); 11-20 (1865-1874); 21-30 (1875-1884); 31-40 (1885-1894); 41-50 (1895-1905).
- Jahresberichte über die Untersuchungen und Fortschritte auf dem Gesamtgebiete der Zuckerfabrikation. 1-12 (1861-1872); 13-26 (1873-1885); 1-40 (1861-1901).
- Journal de pharmacie et de chimie. Series 3, 1-40 (1841-1864); ser. 4, 1-30 (1865-1879); ser. 5, 1-30 (1880-1894).
- Journal für Gasbeleuchtung. 1-16 (1858-1873); 17-31 (1874-1888); 32-46 (1889-1903).
- Journal für praktische Chemie. 1-30 (1834-1843); 31-60 (1844-1853); 61-90 (1854-1863); 91-108 (1864-1869); n. s., 1-50 (1870-1894); 51-100 (1895-1920).
- Journal of Biological Chemistry. 1-25 (1905-1916); 26-50 (1916-1921).
- Journal of Pharmacology and experimental Therapeutics. 1-20 (1907-1922).
- Journal of the American Chemical Society. 1-20 (1879-1898).
- Journal of the American Leather Chemists' Association. 1-10 (1906-1915).

- Journal of the American Medical Association. 1-24 (1883-1906).
- Journal of the Chemical Society. 1-25 (1848-1872), memoirs and proceedings (1841-1847); 26-42 (1873-1882); 43-62 (1883-1892); 63-82 (1893-1902); 83-102 (1903-1912); 103-122 (1913-1922).
- Journal of the Franklin Institute. 1-120 (1826-1885); 121-140 (1886-1895); 141-160 (1896-1905).
- Journal of the Institute of Brewing. Collective Index, covering various publications, 1887-1910; 1911-1923.
- Journal of the Institute of Metals. 1-25 (1909-1921).
- Journal of the Russian Physical-Chemical Society. 41-50 (1909-1918).
- Journal of the Society of Chemical Industry. 1-14 (1882-1895); 15-24 (1896-1905).
- Landwirtschaftlichen Versuchsstationen. 21-50 (1878-1898) in vol. 50.
- Mineralogical Magazine and Journal of the Mineralogical Society. 1-10 (1876-1894).
- Missouri Geological Survey. Index of publications up to 1914 in St. Louis Public Library Mo. Bull. n. s. 12, no. 5: 120-132 (1914).
- Monatshefte für Chemie. 1-10 (1880-1889); 11-22 (1890-1901); 23-30 (1902-1909).
- Nuovo cemento. Ser. 1, vol. 1 to ser. 4, vol. 12 (1843-1900).
- Ohio, Geological Survey. Publications from 1838-1906. In its Bull. 6, pt. 1: 1-234 (1906).
- Ontario, Department of Mines. Reports. 1-16 (1891-1907); 1-25 (1891-1916).
- Paper. 1-10 (1910-1912) in vol. 10.
- Pennsylvania Agricultural Experiment Station. Author index in Bull. no. 180 (1923). Classified by subjects.
- Pharmaceutical Journal and Pharmacist. 1-15 (1841-1856); 16 to ser. 2, vol. 9 (1856-1868); ser. 2, vol. 10 to ser. 3, vol. 8 (1868-1878).
- Philippine Journal of Science. 1-10 (1906-1915).
- Proceedings of the Academy of Natural Sciences of Philadelphia. 1871-1910.
- Proceedings of the American Gas Institute. 1-10 (1906-1915).
- Proceedings of the American Pharmaceutical Association. 1-8 (1852-1859) in vol. 10; 9-17 (1860-1869) in vol. 19; 18-30 (1870-1882) in vol. 32; 31-38 (1883-1890) in vol. 39.
- Proceedings of the American Philosophical Society. 1-50 (1838-1911).
- Proceedings of the American Society for Testing Materials. 1-12 (1898-1912); 13-25 (1913-1922).
- Proceedings of the Iron and Steel Institute. 1869-1881; 1882-1889; 1-50 (1869-1896) (author index); 36-58 (1890-1900); 59-82 (1901-1910) and Carnegie Scholarship Memoirs 1-2; 83-104 (1911-1921) and Carnegie Scholarship Memoirs 3-10.
- Proceedings and Transactions of the Royal Society of Canada. Ser. 1, 1-12; ser. 2, 1-12 (1882-1906).
- Quarterly Journal of Microscopical Science. 1-8, n. s., 1-28 (1853-1880); 29-61 (1888-1916) in vol. 61.
- Rendiconti reale istituto Lombardo di scienze e lettere. 1803-1888; 1889-1900.
- Repertorium für die Pharmacie. 1-100 (1815-1848).
- Revue d'hygiène et de police sanitaire. 1-23 (1879-1901).
- Revue universelle des mines de la métallurgie des travaux publics, des sciences et des arts appliqués à l'industrie. 1857-1876; 1877-1887; 1888-1902.
- Royal Canadian Institute. General index to publications, 1852-1912. Toronto, 1914. 518 p.
- Royal Irish Academy. Serial publications, 1786-1906.
- School of Mines Quarterly. 1-10 (1879-1888) in vol. 10; 11-20 (1889-1899); 21-30 (1899-1909) in vol. 31.
- Scientific Proceedings and Transactions of the Royal Dublin Society. Proceedings 1-8, Transactions 1-6 (1877-1898); Proceedings 9-11, Transactions 7-9 (1898-1909).
- Stahl und Eisen. 1-26 (1881-1906); 27-38 (1907-1918).
- Transactions of the American Ceramic Society. 1-19 (1899-1917).
- Transactions of the American Electrochemical Society. 1-20 (1902-1911); 21-40 (1911-1921) in preparation.
- Transactions of the American Institute of Mining and Metallurgical Engineers. 1-35 (1871-1904); 36-55 (1905-1916); various partial indexes have also been published.
- Transactions of the American Microscopical Society. 1-25 (1878-1902) in vol. 25.
- Transactions of the American Philosophical Society. 1768-1888.
- Transactions of the Cambridge Philosophical Society. 1-12 (1820+).
- Transactions of the Canadian Mining Institute. 1-10 (1898-1907).
- Transactions of the Incorporated Gas Institute. 1865-1893.
- Transactions of the Institution of Mining and Metallurgy. 1-15 (1892-1906).
- Transactions of the Royal Sanitary Institute. 1-15 (1876-1894).

- Transactions of the Royal Society of Edinburgh. 1-34 (1783-1888); 35-46 (1889-1908).
- Transactions of the Royal Society of South Australia. 1-24 (1877-1900).
- Transactions of the Wisconsin Academy of Sciences, Arts and Letters. 1-20 (1870-1921).
- United States. Bureau of Mines. Index of publications. 1922. 37 p.
- United States. Department of Agriculture. Annual Reports. 1837-1893. *In* Div. Pub. Bull. No. 1. 1896.
- United States. Department of Agriculture. Farmers Bulletins. Nos. 1-250; *in* Div. Pub. Bull. No. 8 (1907); 1-500 (1916); 1-1000 (1920).
- United States. Department of Agriculture. Yearbook. 1901-1905, *in* Div. Pub. Bull. No. 9 (1908); 1906-1910, *in* Bull. No. 10 (1913); 1911-1915.
- Zeitschrift für analytische Chemie. 1-10 (1862-1871); 11-20 (1872-1881); 21-30 (1882-1891); 31-40 (1892-1901); 41-50 (1902-1911).
- Zeitschrift für angewandte Chemie und Zentralblatt für technischen Chemie. 1-20 (1887-1907).
- Zeitschrift für anorganische und allgemeine Chemie (formerly Zeitschrift für anorganische Chemie). 1-50 (1892-1906); 51-100 (1906-1917).
- Zeitschrift des Vereines deutscher Ingenieure. 1-10 (1851-1860); 53-62 (1903-1912).
- Zeitschrift für das Berg-, Hütten- und Salinenwesen in dem preussischen Staate. 1-10 (1853-1862) *in* vol. 10; 1-25 (1853-1877); 1-50 (1853-1902).
- Zeitschrift für den physikalischen und chemischen Unterricht. 1-10 (1887-1897); 11-20 (1898-1907).
- Zeitschrift für Elektrochemie und angewandte physikalische Chemie. 1-10 (1894-1904).
- Zeitschrift für Hygiene und Infektionskrankheiten. 1-30 (1886-1899) *in* vol. 30; 1-60 (1886-1908); 61-100 (1908-1924).
- Zeitschrift für Krystallographie und Mineralogie. 1-10 (1876-1885); 11-20 (1885-1891); 21-30 (1891-1897); 31-40 (1897-1902); 1-50 (1877-1912).
- Zeitschrift für physikalische Chemie, Stöchiometrie und Verwandtschaftslehre. 1-24 (1887-1897); 25-50 (1898-1904); 51-75 (1905-1911); 75-78 *in* vol. 78; 79-82 *in* vol. 82; 91-100 (1916-1922) *in* vol. 100.
- Zeitschrift für physiologische Chemie. 1-30 (1877-1900); 31-60 (1900-1908); 61-100 (1908-1917).
- Zeitschrift für Untersuchungen der Nahrungs- und Genussmittel sowie der Gebrauchsgegenstände. 1-16 (1898-1908).
- Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik. 1-10 (1884-1893); 11-20 (1894-1903); 21-30 (1904-1913).
- Zeitschrift für Zuckerindustrie der czechoslovakischen Republik. 1-25 (1876-1901).
- Zentralblatt für Biochemie und Biophysik. II. Biophysikalisches Zentralblatt. 1-4 (1905-1910).

PART IV. BIBLIOGRAPHIES ON SPECIAL SUBJECTS

ABIETIC ACID

LEVY, PAUL. Betrachtungen ueber die Konstitution der Abietinsäure. *Z. anorg. Chem.* 81: 145-155 (1912). Bibl. footnotes.

POOTH, PETER. Zur Kenntniss der Abietinsäure. *Farben-Ztg.* 20: 1056-1059 (1915). 17 footnotes.

TSCHIRCH, A. Abietinsäure. *In his* Die Harze und die Harzbehälter, 1906, p. 548-596. Bibl. footnotes.

See also PINABIETIC ACID, RESINS.

ABRASIVES

HAENIG, A. Emery and the emery industry. London, Scott, 1912. 103 p. Bibl., p. 103, 14 references.

LADOO, RAYMOND B. Garnet. U. S. Bur. Mines, Repts. of Investigations, No. 2347, 1922. 16 p., mimeographed. Bibl., p. 15-16, 23 references.

LEWIS, J. VOLNEY. Abrasives. *Mineral Ind.* 28: 1-10 (1919); 29: 1-11 (1920). 16 references.

MAGNUS, HARRY C. Abrasives of New York State. N. Y. State Museum, 57th Annual Rept. 1: 178-179 (1903). 45 references.

ABSORPTION: Physical. See ADSORPTION.

ABSORPTION: Physiological.

FEKETE, ALEX. v. Ueber die Fettresorption. *Arch. ges. Physiol.* 139: 232-233 (1911).

FRIEDMANN, U. Parenterale Resorption. *In* Oppenheimer, Handb. Biochem. 3, pt. 2: 243-298 (1909). 252 footnotes.

GOLDSCHMIDT, SAMUEL. Mechanism of absorption from the intestines. *Physiol. Rev.* 1: 449-453 (1921). 148 references.

MUNK, IMMANUEL. Resorption. *Ergeb. Physiol.* 1: 296-299 (1902). 137 references.

OVERTON, E. Ueber den Mechanismus der Resorption und der Sekretion. *In* Nagel, Handb. Physiol. 2: 744-899 (1907). Bibl. footnotes.

STARLING, ERNEST H. Die Resorption vom Verdauungskanal aus. *In* Oppenheimer, Handb. Biochem. 3, pt. 2: 208-242 (1909). 72 footnotes.

See also METABOLISM.

ABSORPTION SPECTRA. See SPECTRA.

ACCELERATORS. See VULCANIZATION.

ACENAPHTHENE

HAHN, DOROTHY A., and HOLMES, HARRIET E. The chemistry of ace-

naphthene and its derivatives. *J. Ind. Eng. Chem.* 13: 822-830 (1921). 117 footnotes.

ACETALDEHYDE

MEYER-JACOBSON. Acetaldehyd. *In their* Lehrb. org. Chem. 1, pt. 1: 708-715 (1907). Bibl. footnotes.

PETERSON, W. H., and FRED, E. B. Production of acetaldehyde by certain pentose-forming bacteria. *J. Biol. Chem.* 44: 29 (1920). 30 references.

THIELE, ALBRECHT. Acetaldehyd. Essigsäurealdehyd. *In* Abderhalden, Biochem. Handl. 1: 765-768 (1911). 100 footnotes.

ACETALS

MEYER-JACOBSON. Acetale. *In their* Lehrb. org. Chem. 1, pt. 2: 61-70 (1913). Bibl. footnotes.

SKRABAL, ANTON, and SCHIFFRER, ANTON. Ueber die Hydrolysegeschwindigkeit der Acetale. *Z. physik. Chem.* 99: 290-313 (1921). Bibl. footnotes.

ACETANILIDE

"Acetanilide." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 99-100 (1918). Includes toxicology.

MEYER-JACOBSON. Acetanilid. *In their* Lehrb. org. Chem. 2, pt. 1: 187-188 (1895). Bibl. footnotes.

ACETATES

GUTBIER, A. Acetate. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 695-701 (1911). References through text.

See also ACETIC ACID.

ACETIC ACID

DESCHIENS, MAURICE. Fabrication de l'acide acétique synthétique au départ du carbure de calcium. *Chimie & industrie* 5: 526-528 (1921). About 30 references and 110 patents.

KLAR, M. Technologie der Holzverkohlung, unter besonderer Berücksichtigung der Herstellung von sämtlichen Halb- und Ganzfabrikaten aus den Erstlings-destillaten. Berlin, Springer, 1910. 429 p. About 300 patents on p. 404-419 on wood distillation, acetic acid, acetone, methyl alcohol and turpentine.

LAFAR, FRANZ. Die Essigsäuregärung. *In his* Handb. tech. Mykologie 5: 626-633 (1905-1914).

MEYER-JACOBSON. Essigsäure. *In their* Lehrb. org. Chem. 1, pt. 1: 517-528 (1907). Bibl. footnotes.

ACETIC ACID—Cont'd

SCHMIDT, ERNST. Essigsäure. Äthansäure. *In* Abderhalden, *Biochem. Handl.* 1: 930-951 (1911). About 400 footnotes (includes derivatives).

See also ACETATES, WOOD DISTILLATION.

ACETIC ACID: Toxicology.

"Acid, acetic, toxicology of." *Ind.-Cat. S. G. O.*, 1st ser., 1: 75 (1880); 2nd ser., 1: 101 (1896); 3rd ser., 1: 106-107 (1918).

ACETOACETIC ACID

THIELE, A. Acetessigsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1088-1091 (1911). 70 footnotes.

ACETOACETIC ESTER. *See* ETHYL ACETOACETATE.**ACETONE**

"Acetone." *Ind.-Cat. S. G. O.*, 1st ser., 1: 73 (1880); 2nd ser., 1: 99-100 (1896); 3rd ser., 1: 100-101 (1918). Includes toxicology.

MEYER-JACOBSON. Aceton. *In their* *Lehrb. org. Chem.* 1, pt. 1: 731-737 (1907). Bibl. footnotes.

REMLER, RAYMOND F. Acetone, its properties and uses. Bradford, Pa., National Wood Chemical Assoc., 1924. 26 p. Bibl., p. 22-24.

THIELE, ALERECHT. Aceton. Dimethylketon. *In* Abderhalden, *Biochem. Handl.* 1: 783-797 (1911). 300 footnotes.

WAGNER, IGNATIUS A. The condensation products of acetone. Dissertation, Catholic Univ., Washington, D. C., 1913. References in tabular form and as footnotes.

WORDEN, EDWARD C. Acetone and the ketones. *In his* *Technology of cellulose esters* 1: 2393-2401 (1921). Bibl. footnotes.

See also ACETIC ACID (Klar).

ACETONE: Analytical.

HUBBARD, ROGER S. Determination of the acetone bodies in urine and in blood. *J. Biol. Chem.* 49: 37, 357, 375 (1921). 30 references.

LILLIG, R. Ueber den Nachweis der β -Oxybuttersäure, der Acetessigsäure und des Acetons im Harn. *Pharm. Ztg.* 64: 696-697, 707-709 (1919). 66 footnotes.

ACETONE: Halogen Derivatives.

MEYER-JACOBSON. Halogenderivate der Ketone. *In their* *Lehrb. org. Chem.* 1, pt. 2: 878-884 (1913). Bibl. footnotes.

ACETONE: Physiological.

"Acetonuria." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 101 (1918).

FÜRTH, OTTO V. Acetone bodies. *In his* *Chem. of metabolism*, 1916, 431-451. 60 footnotes.

See also DIABETES, GLYCOSURIA, METABOLISM.

ACETONE DICARBOXYLIC ACIDS

MEYER-JACOBSON. Acetondicarbon-säure. *In their* *Lehrb. org. Chem.* 1, pt. 2: 1216-1218 (1913). Bibl. footnotes.

ACETOPHENONE

MEYER-JACOBSON. Acetophenon. *In their* *Lehrb. org. Chem.* 2, pt. 1: 492-494 (1902). 24 references.

MORGAN, J. L. R., and LAMMERT, OLIVE M. Physical constants of acetophenone. *J. Am. Chem. Soc.* 46: 882-883 (1924). 43 references.

WITTE, E. Acetophenon. *In* Abderhalden, *Biochem. Handl.* 1: 862-867 (1911). 140 footnotes.

ACETPHENETIDINE

KONANTZ, WM. A. Manufacture of acetphenetidine. *J. Am. Pharm. Assoc.* 8: 284-290, 362-385 (1919). 83 references.

ACETYL CELLULOSE. *See* CELLULOSE ACETATE.**ACETYLENE**

"Acetylene." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 102 (1918). Includes toxicology.

LUDWIG, A. Führer durch die gesammte Calciumcarbid- und Acetylenliteratur. Bibliographie der auf diesen Gebieten bisher erschienenen Bücher, Journale, Aufsätze in Zeitschriften, Abhandlungen und wichtigeren Patentschriften. Berlin, Calvary, 1899. 51 p.

MEYER-JACOBSON. Acetylen. *In their* *Lehrb. org. Chem.* 1, pt. 1: 848-876 (1907). Bibl. footnotes.

PANAOTOVIC, JOVAN P. Calciumcarbid und Acetylen in Vergangenheit, Gegenwart und Zukunft. Leipzig, Barth, 1897. Patents, p. 103-124. References, p. 125.

POND, GEORGE C. Calcium carbide and acetylene. Penn. State College, Chem. Dept., Bull., 1917. Bibl., p. 121-139. About 800 references. Revision of Bull. 57 (1900).

STRAUS, FRITZ. Zur Kenntniss der Acetylenbindung. *Ann.* 342: 190-265 (1905). 139 footnotes.

VOGEL, JOHANN J. Das Acetylen, seine Eigenschaften, seine Herstellung und Verwendung. 2nd Ed. Leipzig, Spamer, 1923. 424 p. Bibl., p. 406-409, also bibl. footnotes.

Serial

Jahrbuch für Acetylen und Carbid. Berichte über die wissenschaftlichen und technischen Fortschritte. 1899-

See also ACETIC ACID (Deschiens), CALCIUM CARBIDE, CARBIDES.

ACETYLIDENE COMPOUNDS

LAWRIE, JAMES W. Constitution of the acetylidene compounds. *Am.*

Chem. J. 36: 487-510 (1906). 40 references.

ACID AMIDES

MEYER-JACOBSON. Ammoniakderivate der Fettsäuren. In *their* Lehrb. org. Chem. 1, pt. 1: 599-625 (1907). Bibl. footnotes.

ACIDOSIS

"Acidosis." Ind.-Cat. S. G. O., 3rd ser., 1: 130-131 (1918).

"Diabetes, acidosis in." Ind.-Cat. S. G. O., 3rd ser., 4: 467-468 (1922).

EWING, JAMES. Acidosis and related conditions. Arch. Inter. Med. 2: 353-354, 474-476, 501-503 (1908).

FROTHINGHAM, CHANNING, JR. Acidosis in acute and chronic disease. Arch. Inter. Med. 18: 717-732 (1916). 42 footnotes.

SELLARDS, ANDREW W. The principles of acidosis and clinical methods for its study. Cambridge, Harvard Univ. Press, 1917. 117 p. 71 references, p. 112-117.

VAN SLYKE, DONALD D. Acidosis. In Barker, Endocrinology and metabolism 4: 51-93; references, 5: 511-694 (1922).

WELLS, C. A., and EWING, P. V. Acidosis and cotton seed meal injury. Georgia Agr. Expt. Sta., Bull. 119: 35-64 (1916). 215 references.

ACIDS, ALKALIS, SALTS

BRAUER, ADOLF, and D'ANS, J. Fortschritte in der anorganisch-chemischen Industrie an Hand der deutschen Reichspatente. Band I, 1877-1917. 3 parts, 1184, 1443 and 1285 p. Berlin, Springer, 1921-1923. Lists of patents through text, together with the specifications.

"Fortschritte der anorganisches Grossindustrie während des Weltkrieges." Chem.-Ztg. 43: 745, 769, 813, 833, 861, 881, 890 (1917). 698 footnotes.

HÖLBLING, V. Fortschritte in der Fabrikation der anorganischen Säuren, der Alkalien, des Ammoniaks und verwandter Industriezweige. 1895-1903. Berlin, Springer, 1905. 763 p. Lists of German patents with specifications.

KELER, H. v. Die wichtigsten Fortschritte auf dem Gebiete der anorganischen Grossindustrie, 1908-1915. Z. angew. Chem. 22: 1396, 1445 (1909); 108 footnotes. 23: 624-642 (1910); 96 footnotes. 24: 532, 579 (1911); 132 footnotes. 25: 454, 518 (1912); 146 footnotes. 26: 209-227 (1913); 215 footnotes. 27: 225, 244 (1914); 253 footnotes. 28: 177, 201, 214 (1915); 237 footnotes. 29: 113, 131, 142 (1916); 180 footnotes.

LUNGE, GEORG. The manufacture of acids and alkalis. London, Gurney, 1923—. Contains bibliographies.

MUNROE, CHARLES E., and CHATARD, THOMAS M. Chemicals and allied products. In 12th Census of the U. S., Census Bull. No. 210, 1902. 306 p. Digest of U. S. patents by Story B. Ladd, p. 163-306. Also in Census reports, 10 (manufactures, pt. 4): 523-679, 831-978.

PARTINGTON, J. R. The alkali industry. London, Bailliere, 1918. 304 p. Brief bibl. at end of each chapter.

RAUTER, GUSTAV. Die Fortschritte der chemischen Grossindustrie und der Industrie anorganischer Präparate. Chem.-Z. 2: 273, 305, 335, 527, 597, 635 (1903); 227 footnotes. 3: 12, 39, 163, 291, 503, 531, 654 (1904); 335 footnotes. 4: 49, 76, 120, 145, 268, 291, 384 (1905); 362 footnotes.

REUSCH, K. Jahresbericht ueber die Industrie der Mineralsäuren und des Chlorkalkes. Chem.-Ztg. 27: 185-191 (1903); 105 footnotes. 28: 418-423 (1904); 110 footnotes. 29: 399-405 (1905); 179 footnotes. 30: 326-328 (1906); 47 footnotes. 31: 199-203 (1907); 69 footnotes. 32: 217, 230 (1908); 46 footnotes. 33: 189, 198, 207 (1909); 87 footnotes. 34: 253, 263 (1910); 104 footnotes. 35: 274, 298, 307 (1911); 164 footnotes. 36: 195, 213, 218, 242 (1912); 150 footnotes. 37: 295, 321, 344 (1913); 187 footnotes. 38: 385, 415, 441, 463 (1914); 192 footnotes. 39: 281, 342, 386, 398 (1915); 186 footnotes. 40: 337, 348, 374 (1916); 171 footnotes. 41: 437, 463, 490 (1917); 155 footnotes. 43: 341, 358, 377, 410, 414, 434 (1919); 243 footnotes. 44: 485, 517, 533, 542 (1920); 175 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Acids, alkalis and salts. In *its* Reports of the progress of applied chemistry, 1: 108-132 (1916); 147 footnotes. 2: 175-203 (1917); 167 footnotes. 3: 162-183 (1918); 141 footnotes. 4: 149-169 (1919); 149 footnotes. 5: 162-184 (1920); 162 footnotes. 6: 166-197 (1921); 150 footnotes. 7: 162-183 (1922); 72 footnotes. 8: 184-204 (1923); 80 footnotes. 9: 178-213 (1924); 161 footnotes.

WÄSER, BRUNO. Fortschritte der anorganischen Grossindustrie, 1905-1921. Chem.-Ztg. 37: 1097, 1102, 1218, 1286, 1347, 1370, 1396, 1414, 1462, 1520, 1543, 1567, 1578, 1589 (1913); 586 footnotes. 39: 741, 750, 782, 848, 886, 902, 915, 934, 957, 967, 977, 983 (1915); 1756 footnotes. 46: 229, 234, 277, 317,

ACIDS, ALKALIS, SALTS—Cont'd

322, 360, 410, 435, 453, 474, 482, 498 (1922); 621 footnotes.

See also the names of the individual acids, alkalis and salts.

ACIDS: Organic.

DOHRN, MAX, and THIELE, ALBRECHT. Säuren der aromatischen Reihe. *In* Abderhalden, *Biochem. Handl.* 1: 1183-1377 (1911). Many hundred footnotes.

MEYER-JACOBSON. Die gesättigten einbasischen Carbonsäuren oder Fettsäuren. *In their Lehrb. org. Chem.* 1, pt. 1: 488-557 (1907). Bibl. footnotes.

MEYER-JACOBSON. Die gesättigten Dicarbonsäuren. *In their Lehrb. org. Chem.* 1, pt. 2: 292-407 (1913). Bibl. footnotes.

MEYER-JACOBSON. Oxsäuren oder Alkoholsäuren. I. Die Hydroxylderivate der einbasischen Säuren. II. Die Hydroxylderivate der mehrbasischen Säuren. *In their Lehrb. org. Chem.* 1, pt. 2: 532-719 (1913). Bibl. footnotes.

SCHMIDT, ERNST. Säuren der aliphatischen Reihe. *In* Abderhalden, *Biochem. Handl.* 1: 912-1022 (1911). Many hundred footnotes.

SCHMIDT, ERNST. Ungesättigte Säuren der aliphatischen Reihe. *In* Abderhalden, *Biochem. Handl.* 1: 1023-1052 (1911). Bibl. footnotes.

THIELE, ALBRECHT. Oxsäuren und Polycarbonsäuren der aliphatischen Reihe. *In* Abderhalden, *Biochem. Handl.* 1: 1053-1091 (1911). Bibl. footnotes.

THIELE, ALBRECHT. Zweibasische Säuren (Dicarbonsäuren). *In* Abderhalden, *Biochem. Handl.* 1: 1092-1148 (1911). Many hundred footnotes.

THIELE, ALBRECHT. Drei- und mehrwertige zweibasische Säuren (Oxydicarbonsäuren). *In* Abderhalden, *Biochem. Handl.* 1: 1149-1169 (1911). About 400 footnotes.

THIELE, ALBRECHT. Dreibasische Säuren. *In* Abderhalden, *Biochem. Handl.* 1: 1170-1173 (1911). 65 footnotes.

ACONITE

"Aconite and aconitine." *Ind.-Cat. S. G. O.*, 1st ser., 1: 100-102 (1880); 2nd ser., 1: 127-129 (1896); 3rd ser., 1: 143 (1918). Includes toxicology.

SCHULZE, HEINRICH. Ueber das Aconitin und das Aconin aus *Aconitum Napellus*. *Arch. Pharm.* 244: 136-159 (1906). Bibl. footnotes.

TAYLOR, FRANK O. Bibliography of aconite and the aconite alkaloids from 1890. *J. Ind. Eng. Chem.* 1: 565-567 (1909). 69 references, to papers of chemical character only.

See also ALKALOIDS.

ACONITIC ACID

MEYER-JACOBSON. Aconitsäure. *In their Lehrb. org. Chem.* 1, pt. 2: 461 (1913). 56 references.

THIELE, A. Aconitsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1171-1173 (1911). 33 footnotes.

ACRIDINE

MEYER-JACOBSON. Die Acridin-Gruppe. *In their Lehrb. org. Chem.* 2, pt. 3: 1081-1103 (1918). Bibl. footnotes.

See also QUININE (Laqueur).

ACROLEIN

LOCKEMANN, GEORG, and LIESCHE, OTTO. Ueber die Akroleindarstellung nach dem Borsäureverfahren. *J. prakt. Chem.* 179: 474-496 (1905). Bibl. footnotes.

MEYER-JACOBSON. Acrolein. *In their Lehrb. org. Chem.* 1, pt. 1: 996-1000 (1907). Bibl. footnotes.

ACRYLIC ACID

MEYER-JACOBSON. Acrylsäure Reihe. *In their Lehrb. org. Chem.* 1, pt. 1: 929-979 (1907). Bibl. footnotes.

ACTINIUM

GODLEWSKI, T. Ueber die Eigenschaften des Aktiniums. *Jahrb. Radioakt. Elektronik* 3: 134-135 (1906). 29 references.

HEVESY, G. v. Die Eigenschaften der Emanationen. *Jahrb. Radioakt. Elektronik* 10: 198-199 (1913). 24 references.

LITTLE, H. F. V. Actinium and its disintegration products. *In* Friend, *Textbook*, 4: 441-455 (1917). Bibl. footnotes.

LUCAS, RICHARD. Aktinium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 40-45 (1908). References through text.

MELLOR, J. W. Actinium and its putative parent. *In his Inorg. theor. chem.* 4: 137-138, 146-147 (1923). About 200 references.

NEUBURGER, MAXIMILIAN C. Das Problem der Genesis des Actiniums. *Sammlung chem. chem.-tech. Vorträge* 26: 376-378 (1922). 70 references. Also issued as a separate, Stuttgart, Enke, 1922.

See also RADIUM.

ACTINOCHEMISTRY. See PHOTOCHEMISTRY.**ADALIN**

"Adalin." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 162-163 (1918).

See also SEDATIVES.

ADENASE. See AMIDASE.

ADENINE

MEYER-JACOBSON. Adenin. *In their* Lehrb. org. Chem. 2, pt. 3: 1327-1331 (1920). Bibl. footnotes.

See also PURINES.

ADHESIVES

ANDES, LOUIS E. Neuerungen auf dem Gebiete der Herstellung von Klebmitteln. Chem.-Ztg. 25: 1060-1062 (1901); 30 footnotes. 26: 459-460 (1902); 20 footnotes.

HALEN, S. Die in Deutschland patentierten Verfahren zur Herstellung von Klebstoffen (ausser Leim). Kunststoffe 11: 81-83, 90-93, 99-100 (1921). Patents.

KAUSCH, O. Klebstoffe und Bindemittel. Kunststoffe 3: 63-66, 89-92, 110-112, 127-130 (1913). Patents.

MARZAHN, R. Literatur-Verzeichnis über Klebstoffe. Farben-Ztg. 20: 1241-1242 (1915). About 60 books listed.

SCHOLL, M. Kitte, Kleb und Bindemittel. Kunststoffe 7: 57-59, 75-77 (1917). Continued by HALEN, *Ibid.* 9: 129-131, 146-147 (1919). Patents.

See also CASEIN, GELATIN, GLUE, SODIUM SILICATE, SULFITE WASTE LIQUORS (Johnsen).

ADIPIIC ACID

MEYER-JACOBSON. Adipinsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 394-400 (1913).

THIELE, A. Adipinsäure. *In* Abderhalden, Biochem. Handl. 1: 1138-1141 (1911). 50 footnotes.

ADIPOCERE

"Adipocere." Ind.-Cat. S. G. O., 1st ser., 1: 115-116 (1880); 2nd ser., 1: 151 (1896); 3rd ser., 1: 174 (1918).

ADRENALINE

ALDRICH, T. B. Adrenaline. J. Am. Chem. Soc. 27: 1070-1071 (1905). 34 references.

CRAWFORD, ALBERT C. The use of suprarenal glands in the physiological testing of drug plants. U. S. Dept. Agr., Bur. Plant Ind., Bull. No. 112, 1907. 32 p. Bibl. footnotes.

FAUST, EDWIN S. Adrenalin. *In* Abderhalden, Biochem. Handl. 5: 454-456 (1911). Bibl. footnotes.

FAUST, EDWIN S. Adrenalin. *In* Abderhalden, Handb. biol. Arbeitsm., Abt. 4, pt. 7: 758-766 (1923). Bibl. footnotes.

FÜRTH, O. v. Suprarenin (Adrenalin). *In* Abderhalden, Biochem. Handl. 5: 495-506 (1911). 165 footnotes.

GRUBER, CHARLES M. The significance of epinephrine in muscular activity. Endocrinology 3: 145-153 (1919). 49 references.

GRUBER, CHARLES M. The effect of epinephrine on the digestive tract. J. Pharmacol. 20: 321-357 (1922). 64 references.

HOSKINS, R. G. The relation of the adrenals to the circulation. Physiol. Rev. 2: 343-360 (1922). 56 references.

HULTGREN and ANDERSSON. Studien ueber die Physiologie und Anatomie der Nebennieren. Skand. Arch. Physiol. 9: 72-313 (1899). Bibl. footnotes.

KURIYAMA, S. Epinephrine content of the adrenals under various experimental conditions. J. Biol. Chem. 34: 299 (1918). 45 references.

ROGOFF, J. M. Liberation of epinephrin from the adrenal glands. J. Lab. Clin. Med. 3: 209-219 (1918). 41 references.

SCHULTZ, WM. H. Quantitative pharmacological studies: adrenalin and adrenalin bodies. U. S. Hyg. Lab., Bull. No. 55, 1909. 77 p. Bibl. p. 71-74.

STEWART, G. N. Adrenalectomy and the relation of the adrenal bodies to metabolism. Physiol. Rev. 4: 189-190 (1924). 73 references.

TRENDELENBURG, P. Die Adrenalinsekretion unter normalen und gestörten Bedingungen. Ergebnisse Physiol. 21, pt. 2: 500-505 (1923). 243 references.

TRENDELENBURG, P. Adrenalin und adrenalinverwandte Substanzen. *In* Heffter, Handb. exp. Pharmakologie, 2, 2nd half: 1130-1293 (1924). Bibl. footnotes.

See also SUPRARENALS.

ADSORPTION

BANCROFT, WILDER D. Adsorption. *In his* Applied colloid chemistry, 1921, p. 3-128. Bibl. footnotes.

BEMMELEN, J. M. VAN. Die Adsorption. Dresden, Steinkopff, 1910. 548 p. Bibl. footnotes.

BEMMELEN, J. M. VAN. Die Adsorption von Stoffe aus Lösungen. Z. anorg. Chem. 23: 321-372 (19007). Bibl. footnotes.

FREUNDLICH, HERBERT. Ueber die Adsorption in Lösungen. Z. physik. Chem. 57: 385-470 (1907). Bibl. footnotes.

GUSTAFER, BROR. Die Sorption von Dämpfen durch Kohle. Kolloidchem. Beihefte 15: 185-338 (1922). Bibl. footnotes.

HÖBER, RUDOLF. Die Erscheinungen an den Grenzflächen. *In his* Physikalische Chemie der Zelle und der Gewebe, 4th ed., p. 198-225 (1914). Bibl. footnotes.

ADSORPTION—Cont'd

HOOKE, MARIAN O., and FISCHER, MARTIN H. Ueber die Aufnahme von Wasser durch das Nervengewebe. *Kolloid-Z.* 10: 283-294 (1912). 45 footnotes.

KOLTHOFF, I. M. [The rise and evaluation of adsorbents.] *Pharm. Weekblad* 56: 207-225, 237-258 (1919). 50 references.

KRULLA, RUDOLF. Adsorption mit besonderer Berücksichtigung der Verhältnisse beim Aufsteigen von Salzlösungen in Filtrierpapier. *Z. physik. Chem.* 66: 307-312 (1909). 47 titles, covering 1861-1908.

MATHEWS, ALBERT P. Adsorption. *Physiol. Rev.* 1: 594-597 (1921). 80 references.

MELLOR, J. W. The adsorption of gases, etc., by carbon. *In his Inorg. theor. chem.* 5: 807-811 (1924).

PATTEN, HARRISON E. Energy changes accompanying absorption. *Trans. Am. Electrochem. Soc.* 11: 387-405 (1907). 50 footnotes.

SCHERINGA, K. [Surface condensation (adsorption) of water vapor and gases and the resultant error in weighing.] *Pharm. Weekblad* 56: 94-107 (1919). 61 footnotes.

SCHULEMANN, WERNER. Die vitale Färbung mit sauren Farbstoffen in ihrer Bedeutung für Anatomie, Physiologie, Pathologie und Pharmakologie. *Biochem. Z.* 80: 1-140 (1917). *Bibl. footnotes.*

See also CHARCOAL, COLLOIDS.

AGAR-AGAR

"Agar-agar." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 185 (1918). 10 references.

FELLERS, CARL R. Some bacteriological studies on agar-agar. *Soil Science* 3: 255-290 (1916); *J. Ind. Eng. Chem.* 8: 1128 (1916). 33 references.

WHITTAKER, H. A. The source, manufacture and composition of commercial agar-agar. *J. Am. Pub. Health Assoc.* 1: 639 (1911). 10 references.

AGGLUTININS. See IMMUNITY.**AGRICULTURAL CHEMISTRY**

BLANCK, E. *Agrikulturchemie. Fortschritte Chem.* 4: 211-229 (1911); 6: 69-90 (1912-13); 8: 159-168, 227-247 (1913); 10: 113-125, 145-158 (1914-15); 11: 193-200, 229-242 (1915-16); 13: 75-92 (1917-18) 14: 1-23 (1918); 15: 99-120 (1919-20). *References through text.*

BREHM, HANS. Ueber die Fortschritte und Aussichten der jüngerer Agrikulturchemie (speziell der Bodenchemie) seit Anwendung der neueren Ergebnisse der physikalischen Chemie, besonders der Kolloidchemie.

Kolloid-Z. 13: 33-35 (1913). 94 references.

CHEMICAL SOCIETY. Agricultural chemistry and vegetable physiology. *In Annual Reports on the Progress of Chemistry*, vol. 1+. 1904 to date. *Bibl. footnotes*, comprising a selected *bibl. of the subject.*

EHRENBERG, PAUL. Die Beziehungen der Kolloidforschung zur Agrikulturchemie. *Kolloid-Z.* 3: 193-200 (1908); 4, 76-86 (1909). 167 footnotes.

EHRENBERG, PAUL. Fortschritte auf dem Gebiete der Agrikulturchemie. *Chem.-Ztg.* 38: 953, 1013, 1022, 1038 (1914); 260 footnotes. 39: 453, 470 (1915); 249 footnotes. 40: 1029, 1050, 1060 (1916); 386 footnotes.

ENGELS, O. *Agrikulturchemie. Fortschritte Chem.* 16: 151-173 (1921); 17: 85-110 (1921). *References through text.*

HEBEBRAND, A. Fortschritte der Agrikulturchemie. *Chem.-Ztg.* 24: 995, 1016 (1900); 120 footnotes. 25: 1025-1027 (1901); 70 footnotes.

HONCAMP, F. and NOLTE, O. *Agrikulturchemie. Dresden, Steinkopff, 1924.* 160 p. *Covers literature from 1914 to 1923.*

KAPPEN, H. *Agrikulturchemie. Fortschritte Chem.* 1: 153-156, 213-218 (1909); 2: 307-319 (1910). *References through text.*

LEMMERMANN, OTTO. Die Agrikulturchemie im 1903. *Chem.-Z.* 3: 136, 172, 204 (1904). 103 footnotes.

LIST of publications of the Department of Agriculture, 1862-1902, with analytic index. Washington, Govt. print. off., 1904. 623 p. (*Bibl. of U. S. Public Documents. Dept. list no. 1.*)

MACH, F. Fortschritte der Agrikulturchemie. *Chem.-Ztg.* 26: 996-1001 (1902); 177 footnotes. 27: 417-422 (1903); 234 footnotes.

PFEIFFER, TH. Die Agrikulturchemie im 1902. *Chem.-Z.* 2: 13, 51, 85, 343, 366, 399 (1903). 179 footnotes.

RUSSELL, E. J. Report on the part played by colloids in agricultural phenomena. *In Second report on colloid chemistry (British Assoc. Adv. Sci.), p. 79-81 (1919). Classified by subject.*

SOCIETY OF CHEMICAL INDUSTRY. Agricultural chemistry. *In Reports of the progress of applied chemistry*, 3: 342-361 (1918); 88 footnotes. 4: 365-376 (1919); 87 footnotes. 5: 370-388 (1920); 67 footnotes. 9: 426-450 (1924); 182 footnotes.

STUTZER, A. Bericht ueber die wesentlichen Fortschritte der Agrikultur-

chemie. Chem.-Ztg. 28: 149-152 (1904); 84 footnotes. 29: 257-261 (1905); 117 footnotes. 30: 313-316 (1906); 105 footnotes. 31: 547-549, 561-562 (1907); 106 footnotes. 32: 466-468 (1908); 60 footnotes. 33: 217-218, 230-231 (1909); 43 footnotes. 34: 1181-1182, 1191-1192 (1910); 77 footnotes. 36: 849-851, 870-872 (1912); 109 footnotes.

ZIELSTORFF, W. Agrikulturchemie. Chem.-Z. 4: 178, 198, 219, 491, 505 (1905); 6: 1-6, 65-70 (1907). Bibl. footnotes.

Serial

Agricultural index. New York. 1916-. Cumulates every three years. Indexes journals devoted to agriculture as well as a large number of reports and bulletins from government sources and organizations in leading agricultural centers of the world. Contains many entries of chemical interest.

Centralblatt für Agrikulturchemie und rationellen Landwirtschaftsbetrieb (Biedermann's). 1872-. Classified. Rather complete abstracts.

Chemical abstracts. See Part II.

Experiment station record. See Part II.

Jahresbericht für Agrikulturchemie. Berlin, 1858-. Abstracts and lists of references. Classified as follows: Plant production; sources of plant food—atmosphere, water, soil, fertilizers; plant growth, physiology, constituents of plants, plant culture; animal production; foods and feeding-stuffs; chemical physiology; metabolism and nutrition; milk, butter and cheese; agricultural by-products; flour, bread, starch, sugar; fermentation, wines; methods of analysis.

See also FERTILIZERS, SOILS, ETC.

AIR

"Air." Ind.-Cat. S. G. O., 1st ser., 1: 132-143 (1880); 2nd ser., 1: 172-183 (1896); 3rd ser., 1: 195-201 (1918). Includes compressed and rarified air, effects of air, purification of air, moisture of air, sea air, etc.

BENEDICT, FRANCIS G. The composition of the atmosphere with special reference to the oxygen content. Carnegie Inst., Pub. No. 166. Washington, 1912. 115 p. Numerous references on air analysis.

CHANCE, EDWIN A. Partial list of papers and books bearing upon the subject of air and air analysis. J. Franklin Inst. 172: 490-494 (1911). 100 references.

HÉBERT, A. Air atmosphérique. In Moissan, Chim. min. 1: 662-685 (1904). 242 footnotes.

PRANDTL, W. Die atmosphärische Luft. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 50-63 (1907). References through text.

See also FOODS (Vereinbarungen).

AIR: Liquid.

HOWELL, S. P., PAUL, J. W., and SHERICK, J. L. Progress of investigations on liquid-oxygen explosives. U. S. Bur. Mines, Tech. Paper No. 294. Washington, 1923. 91 p. "Selected bibl. on liquid air," p. 81-85.

PRANDTL, W. Flüssige Luft. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 63-65 (1907). References through text.

See also OXYGEN.

AIR CONDITIONING

SLOBOD, A. Air conditioning. Carnegie Library of Pittsburgh, 1914. 55 p. Relates only to air supplies for buildings.

AIRPLANE DOPES. See CELLULOSE ACETATE.

ALANINE

MEYER-JACOBSON. α -Aminopropionsäure. In their Lehrb. org. Chem. 1, pt. 2: 754-756 (1913). Bibl. footnotes.

ZEMPLÉN, GÉZA. Alanin. In Abderhalden, Biochem. Handl. 4: 486-522 (1911); 9: 92-100 (1914). About 500 footnotes. (Includes derivatives.)

ZEMPLÉN, GÉZA. β -Alanin. In Abderhalden, Biochem. Handl. 4: 730-738 (1911); 9: 160-161 (1914). 35 footnotes.

ALBITE

JACOBY, R. Albit. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 277-278 (1912). References through text.

ALBUMIN

[Chemistry and physiology of albumin.] Ind.-Cat. S. G. O., 1st ser., 1: 160-162 (1880); 2nd ser., 1: 202-206 (1896); 3rd ser., 1: 221-231 (1918). Includes digestion of albumin.

SAMUELY, FRANZ. Albumine. In Abderhalden, Biochem. Handl. 4: 58-80 (1911). Bibl. footnotes.

STRAUSS, EDUARD. Albuminoide. In Abderhalden, Biochem. Handl. 4: 169-197 (1910). 170 footnotes.

STRAUSS, EDUARD. Proteinoide. In Abderhalden, Handb. biol. Arbeitsm., 1, pt. 8: 551-576 (1921). Bibl. footnotes.

See also PROTEINS.

ALBUMINURIA

"Albuminuria, chemistry and semeiology of." *Ind.-Cat. S. G. O.*, 1st ser., 1: 167-168 (1880); 2nd ser., 1: 206-214 (1896); 3rd ser., 1: 231-240 (1918).

ALCHEMY

"Alchemy and hermetic medicine." *Ind.-Cat. S. G. O.*, 1st ser., 1: 170-172 (1880); 2nd ser., 1: 214-216 (1896); 3rd ser., 1: 214-243 (1918).

BACCIONI, G. B. *Dall'alchimia alla chimica. Con figure nel testo.* Torino, Bocca, 1903. 446 p. *Bibl.*, p. 417-436.

BARRETT, FRANCIS. *The lives of alchemistical philosophers; with a critical catalogue of books in occult chemistry and a selection of the most celebrated treatises on the theory and practice of the hermetic art.* London, Luckington, Allen and Co., 1815. 384 p. "Alchemical books," p. 95-112.

BOLTON, HENRY C. *Alchemy. In his Select bibliography of chemistry, 1492-1892* (Smithsonian Inst., Misc. Coll., No. 850), p. 943-1067; 2nd suppl., p. 200-218 (1904).

BOLTON, HENRY C. *Catalogue of works on alchemy and chemistry, exhibited at the Grolier Club, New York, Jan. 16 to Jan. 26, 1891.* New York, De Vinne press, 1891. 32 p. 110 titles, annotated.

BOLTON, HENRY C. *The literature of alchemy.* *Pharm. Rev.*, 19, nos. 4-5 (1901). 11 p.

FERGUSON, JOHN. *Bibliotheca chemica: A catalog of the alchemical, chemical and pharmaceutical books in the collection of the late James Young of Kelly and Durris.* Glasgow, Micklehose, 1906. 2 vols.

JOLLIVET-CASTELOT, FRANÇOIS. *Comment on devient alchimiste; traité d'hermétisme et d'art spagyrique basé sur les clefs du tarot.* Paris, Chamuel, 1897. 417 p. *Bibl.*, p. 401-407.

KOPP, HERMANN. *Die Alchemie in älterer und neuerer Zeit. Ein Beitrag zur Culturgeschichte.* Heidelberg, Winter, 1886. 2 vols. *Bibl.*, vol. 2: 308-396.

LIPPMANN, EDMUND O. *Entstehung und Ausbreitung der Alchemie.* Berlin, Springer, 1919. 742 p. *Bibl. footnotes.*

REDGROVE, HERBERT S. *Alchemy: ancient and modern, being a brief account of the alchemistic doctrines and their relations, to mysticism on the one hand, and to recent discoveries in physical science on the other; together with some particulars re-*

garding the lives and teachings of the most noted alchemists. 2nd ed. London, Rider, 1922. 141 p. *Bibl. footnotes.*

SCHMIEDER, KARL C. *Geschichte der Alchemie.* Halle, 1832. 613 p. Contains *bibl.* of the various alchemists.

WAITE, ARTHUR E. *Lives of alchemistical philosophers based on materials collected in 1815 and supplemented by recent researches with a philosophical demonstration of the true principles of the magnum opus or great work of alchemical reconstruction and some account of the spiritual chemistry. To which is added a bibliography of alchemy and hermetic philosophy.* London, Redway, 1883. 315 p. "An alphabetical catalog of works on hermetic philosophy and alchemy," p. 276-306.

See also HISTORY.

ALCOHOL. *See ETHYL ALCOHOL.*

ALCOHOL as MOTOR FUEL

ELLIS, C., and MEIGS, J. V. *Alcohol as motor fuel. In their Gasoline and other motor fuels, 1921,* p. 564-566. 54 references.

FARMER, R. C. *Industrial and power alcohol.* London, Pitman, 1921. 110 p. *Bibl.*

LESLIE, E. H. *Alcohol, a motor fuel of the future. In his Motor fuels, 1923,* p. 482-508. *Bibl.*, p. 504-508.

MONIER-WILLIAMS, G. W. *Power alcohol, its production and utilization.* London, Frowde, 1922. 323 p. *Bibl.* at end of chapters.

ALCOHOLS

BRUNEL, R. F., CRENSHAW, J. L., and TOBIN, E. *Purification and some physical properties of certain aliphatic alcohols.* *J. Am. Chem. Soc.* 43: 561-577 (1921). 35 references on p. 576 and *bibl. footnotes.*

GERNGROSS, OTTO. *Alkohole. In Abderhalden, Biochem. Handl.* 1: 368-482 (1911). Many hundred *footnotes.*

MEYER-JACOBSON. *Die einwertigen Alkohole der Grenzreihe. In their Lebrb. org. Chem.* 1, pt. 1: 193-266 (1907).

PINCUSOHN, L. *Ungesättigte einwertige Alkohole der aliphatischen Reihe. In Abderhalden, Biochem. Handl.* 1: 483-494 (1911). 100 *footnotes.*

PINCUSOHN, LUDWIG. *Alkohole der aromatischen Reihe. In Abderhalden, Biochem. Handl.* 1: 705-751 (1911). *Bibl. footnotes.*

WEIL, ARTHUR. *Qualitativer und quantitativer Nachweis der einzelnen biologisch wichtigen hochmolekularen Alkohole. In Abderhalden, Handb.*

biol. Arbeitsm. 1, pt. 4: 179-191 (1920). Bibl. footnotes.

See also names of individual alcohols, e. g. METHYL, ETHYL, PROPYL, etc.; PHENOLS.

ALDEHYDES

"Aldehydes and derivatives." Ind.-Cat. S. G. O., 1st ser., 1: 184 (1880); 2nd ser., 1: 243 (1896); 3rd ser., 1: 280-281 (1918).

FEINBERG, B. G. Quantitative study of some aldehyde reactions. Am. Chem. J. 49: 111-116 (1913). 115 references, covering 1853-1911.

MEYER-JACOBSON. Die gesättigten einwertigen Aldehyde und Ketone. In *their* Lehrb. org. Chem. 1, pt. 1: 639-785 (1907). Bibl. footnotes.

MEYER-JACOBSON. Aromatische Aldehyde. In *their* Lehrb. org. Chem. 2, pt. 1: 478-488 (1896). Bibl. footnotes.

THIELE, ALBRECHT. Aldehyde der aliphatischen Reihe. In *Abderhalden*, Biochem. Handl. 1: 752-783 (1911). Many hundred footnotes.

WITTE, E. Aldehyde der aromatischen Reihe. In *Abderhalden*, Biochem. Handl. 1: 808-861 (1911). Many hundred footnotes.

See also names of individual aldehydes, SOIL ALDEHYDES.

ALEUDRIN

"Aleudrin." Ind.-Cat. S. G. O., 3rd ser., 1: 283 (1918). 10 references.

ALGAE

HOAGLAND, D. R., and LIEB, L. L. Complex carbohydrates and forms of sulfur in marine algae of the Pacific Coast. J. Biol. Chem. 23: 287-297 (1915). 30 references.

See also FERTILIZERS.

ALIZARIN

MEYER-JACOBSON. Alizarin. In *their* Lehrb. org. Chem. 2, pt. 2: 552 (1903). 34 references.

See also DYES.

ALKALI METALS

MELLOR, J. W. The alkalis. In *his* Inorg. theor. chem. 2: 421-880 (1922). History, p. 422, 30 references; occurrence, p. 427, 50 references; preparation, p. 450, 150 references; properties, p. 474, 600 references; alloys, p. 481, 15 references; hydrides, p. 484, 35 references; oxides, p. 493, 100 references; hydroxides, p. 509, 300 references; fluorides, p. 518, 100 references; chlorides, p. 555, 800 references; bromides, p. 588, 200 references; iodides, p. 612, 400 references; sulfides, p. 628, 100 references; polysulfides, p. 640, 100 references; hydrosulfides, p. 645, 25 references; sulfates, p. 673, 400 references; hydro-

sulfates, p. 692, 300 references; carbonates, occurrence, p. 725, 300 references; carbonates, properties, p. 769, 250 references; bicarbonates, p. 779, 150 references; nitrates, p. 821, 400 references; orthophosphates, p. 851, 300 references; pyrophosphates, p. 866, 50 references; metaphosphates, p. 871, 25 references.

See also CESIUM, LITHIUM, POTASSIUM, RUBIDIUM, SODIUM.

ALKALINE EARTH METALS

MELLOR, J. W. The alkaline earths. In *his* Inorg. theor. chem. 3: 619-908 (1923). History, p. 621, 20 references; occurrence, p. 625, 60 references; preparation, p. 630, 50 references; properties, p. 644, 200 references; atomic weights, p. 648, 50 references; bromides, p. 733, 75 references; carbonates, p. 847, 450 references; chlorides, p. 723, 400 references; fluorides, p. 695, 150 references; hydroxides, p. 686, 200 references; iodides, p. 740, 75 references; nitrates, p. 863, 200 references; oxides, p. 652, 250 references; phosphates, p. 864, 400 references; sulfates, p. 760, 450 references; sulfides, p. 740, 200 references.

See also BARIUM, CALCIUM, MAGNESIUM, STRONTIUM.

ALKALIS. See ACIDS, ALKALIS, SALTS; ALKALI METALS; ALKALINE EARTHS; names of individual alkalis.

ALKALOIDS

"Alkaloids." Ind.-Cat. S. G. O., 1st ser., 1: 194-195 (1880); 2nd ser., 1: 257-258 (1896); 3rd ser., 1: 293-295 (1918).

ARNY, H. V. Principles of pharmacy. 2nd ed., p. 839-842. 253 titles.

BACON, RAYMOND F. Physiologically active constituents of certain Philippine medicinal plants. Philipp. J. Sci. 1: 1007-1036 (1906). 48 footnotes.

BAUER, H. Der heutige Stand der Synthese von Pflanzenalkaloiden. Brunswick, 1913. 144 p.

BAUER, K. H. [Alkaloidal chemistry for 1921.] Süddeutsche Apoth.-Ztg. 62: 119-121, 130-132, 137-138, 143-144 (1922). Bibl. footnotes.

BRÜHL, WILH. Die pflanzen Alkaloide. Braunschweig, Vieweg, 1900. 586 p. Bibl. footnotes.

DUBY, —. Les alcaloides. Paris, 1887. About 4000 references.

EINBECK, H. Alkaloidchemie. Fortschritte Chem. 2: 75-82 (1910); 3: 283-294 (1910-11); 5: 175-187 (1912); 7: 71-80 (1913); 9: 189-203 (1914); 11: 185-192 (1914-15); 14: 79-94 (1918-19). References through text.

ALKALOIDS—Cont'd

- GÖSSLING, W. Die Fortschritte der Alkaloidchemie. Chem.-Ztg. 32: 389, 406, 420 (1908); 74 footnotes. 33: 817, 825, 835, 842, 852 (1909); 83 footnotes. 34: 909, 917, 923 (1910); 59 footnotes.
- GUARESCHI, ICITIO. Alkaloide. Einführung in das Studium der Alkaloide mit besonderer Berücksichtigung der vegetabilischen Alkaloide und der Ptomaine. Berlin, 1896-1897. 657 p. Bibl. footnotes.
- HENRY, THOMAS A. The plant alkaloids. 2nd ed. Philadelphia, Blakiston, 1924. 456 p. Bibl. footnotes.
- HÜBNER, OTTO. Die Alkaloidchemie in den Jahren 1910-1911. Chem.-Ztg., 35: 1369-1370, 1395-1397 (1911); 33 footnotes. 36: 1493-1495, 1505-1507 (1912); 36 footnotes.
- LANGENHAN, HENRY A. The alkaloidal content of stramonium leaves. Bull. Univ. Wisconsin, No. 692 (Science ser., 4, no. 6), p. 19-33. 50 references, covering 1891-1914.
- POLONOVSKI, MICHEL. Mode de formation et rôle des alcaloïdes dans la plante. Bull. soc. chim. (4) 35: 1399-1403 (1924).
- POPE, F. G. Modern research in organic chemistry. London, Methuen, 1912. 342 p. p. 190-199 give a selected bibl. of about 200 titles.
- SCHMIDT, JULIUS. Die Alkaloidchemie in den Jahren 1900-1904. 114 p. 1904-1907. 146 p. 1907-1911. 284 p. Stuttgart, Enke, 1904-1911. Bibl. footnotes.
- SCHMIDT, JULIUS. Pflanzenalkaloide. In Abderhalden, Biochem. Handl. 5: 1-452 (1911). Bibl. footnotes.
- SPIEGEL, L. Die Fortschritte der Alkaloidchemie seit Beginn des Jahrhunderts. Biochem. Centr. 5: 97-104, 149-166 (1906). 142 references.
- TRIER, GEORG. Die Alkaloidchemie in den Jahren 1912 bis 1918. Chem.-Ztg. 43: 146, 158, 173, 189 (1919). 256 footnotes.
- WERNER, A. Unsere Kenntniss ueber Konstitution und Synthese des Alkaloide bis Juni 1902. Chem.-Z. 2: 3, 42, 77, 109, 139, 171 (1902-1903). 147 footnotes.
- WOLFFENSTEIN, RICHARD. Die Pflanzenalkaloide. 3rd ed. Berlin, Springer, 1922. 506 p. Bibl. footnotes. See also names of individual alkaloids; PHARMACEUTICALS (Soc. Chem. Ind.); TOXICOLOGY.
- ALKALOIDS: Analytical.**
- BAUER, IL. Analytische Chemie der Alkaloide. Berlin, Borntraeger, 1921. 425 p. Bibl. footnotes.
- HERZIG, PAUL. Die Methoden der quantitativen Bestimmung der Alkaloide. Arch. Pharm. 259: 249-308 (1921). Bibl. footnotes.
- LINDE, O. Die massanalytische Bestimmung der Alkaloide. Arch. Pharm. 238: 102-135 (1900). Bibl. footnotes.
- MURRILL, PAUL I. Alkaloidal estimation: a bibliographical index of chemical research prepared from original literature for the committee of revision and publication of the Pharmacopoeia of the U. S. A., 1890-1900. Ann Arbor, 1898. 58 p. Covers 1877-1897.
- ALKAPTONURIA**
- FALTA, W. Die Alkaptonuria. Biochem. Centr. 3: 174-176 (1904). 16 titles.
- FROMMHERZ, K. Neuere Forschungen auf dem Gebiet der Alkaptonurie. Biochem. Centr. 8: 1-9 (1908). 51 references.
- PINCUSOHN, LUDWIG. Alkaptonurie. Ergeb. inneren Medizin 8: 454-458 (1912). 144 references.
- ROSENBLUM, JACOB, and KAHN, MAX. Alkaptonuria. In Barker, Endocrinology and metabolism 4: 501-514; bibl., 5: 511-694 (1922).
- ALKYL AMINES**
- MEYER-JACOBSON. Alkylamine. In their Lehrb. org. Chem. 1, pt. 1: 340-381 (1907). Bibl. footnotes.
- ALKYL ESTERS**
- WORDEN, EDWARD C. Alkyl esters. In his Technology of cellulose esters 1: 2496-2509 (1921). Bibl. footnotes.
- ALKYL ETHERS**
- MEYER-JACOBSON. Einfache und gemischte Alkyläther. In their Lehrb. org. Chem. 1, pt. 1: 283-298 (1907). Bibl. footnotes.
- See also ETHYL ETHER, ETC.
- ALKYL HALIDES**
- MEYER-JACOBSON. Alkylhalogenide. In their Lehrb. org. Chem. 1, pt. 1: 267-283 (1907). Bibl. footnotes.
- See also names of individual compounds.
- ALKYL NITRATES**
- MEYER-JACOBSON. Ester der Salpetersäure. In their Lehrb. org. Chem. 1, pt. 1: 310-314 (1907). Bibl. footnotes.
- ALKYL SULFATES**
- MEYER-JACOBSON. Schwefelsäureester. In their Lehrb. org. Chem. 1, pt. 1: 304-308 (1907). Bibl. footnotes.
- ALKYLENE DIHALIDES**
- MEYER JACOBSON. Verbindungen vom Typus des Äthylenchlorids. In their Lehrb. org. Chem. 1, pt. 2: 29-46 (1913). Bibl. footnotes.

ALKYLENES

MEYER-JACOBSON. Alkylenes. *In their* Lehrb. org. Chem. 1, pt. 1: 813-892 (1907). Bibl. footnotes.

ALLANTOIN

BRAHM, CARL. Allantoin. *In* Abderhalden, Biochem. Handl. 4: 1151-1156 (1911); 9: 322-324 (1915). 70 footnotes.

MEYER-JACOBSON. Allantoin. *In their* Lehrb. org. Chem. 2, pt. 3: 458-463 (1916). Bibl. footnotes.

ALLOTROPY

COPISAROW, MAURICE. A theory of allotropy. *J. Am. Chem. Soc.* 43: 1870-1888 (1921). 150 footnotes.

DAMIENS, M. A. L'Allotropie. *Bull. soc. chim.* (4) 35: 87-125 (1924). Bibl. footnotes.

MEYER, JULIUS. Die Allotropie der chemischen Elemente. Sammlung chem. chem.-tech. Vorträge 15: 43-108 (1910). Bibl. footnotes.

SMITS, A. The theory of allotropy. New York, Longmans, 1922. 397 p. Bibl. footnotes.

ALLOXAN

MEYER-JACOBSON. Alloxan. *In their* Lehrb. org. Chem. 2, pt. 3: 1200-1206 (1920). Bibl. footnotes.

See also PYRIMIDINES.

ALLOYS

ANDERSON, R. J. Contraction and shrinkage of nonferrous alloys as related to casting practice. U. S. Bur. Mines, Repts. of Investigations, No. 2410. Nov., 1922. 45 references.

DESCH, CECIL H. Colloidal systems in solid crystalline media. Fourth Report on Colloid Chemistry, 1922, 33-40. 26 references.

DESCH, CECIL H. Intermetallic compounds. New York, Longmans, 1914. 116 p. Bibl., p. 109-113. 201 titles.

ESTES, CLARENCE. Bibliography of alloys, binary, ternary, and quaternary systems, whose equilibria have been investigated. *Met. Chem. Eng.* 16: 273-282 (1917); 18: 312 (1918). Covers 420 alloys.

GILBERT, KARL. Versuche ueber die Volumenänderung von binären Metalllegierungen. *Z. Metallkunde* 14: 245-253 (1922).

GIUA, M., and GIUA-SOLLINI, C. Combinazioni chimiche fra metalli. Milan, Hoepli, 1917. 446 p.

GUILLET, LÉON. Le méthodes d'étude des alliages métalliques. Paris, Dunod, 1923. 503 p. Bibl. at end of each chapter.

GULLIVER, GILBERT H. Metallic alloys: their structure and constitution. 4th ed. London, Griffin, 1921. 439 p. Bibl. at end of chapters.

HOFMAN, H. O. Alloys. *In his* General metallurgy, 1913, p. 33-69. Bibl. footnotes.

HOUGHTON, JOHN L. Typical alloy systems. *In* Glazebrook, Dictionary of Applied Physics, 5: 221-245 (1923). Bibl. footnotes.

JÄNECKE, E. Employment of physical chemistry in metallography. *Ion* 1: 136-155, 209-229 (1909). Classified bibl., supplementing that of Sack.

LAW, EDWARD F. Alloys and their industrial applications. London, Griffin, 1917. 332 p. Bibl. at end of chapters.

REINGLASS, PAUL. Chemische Technologie der Legierungen. I. Die Legierungen mit Ausnahme der Eisen-Kohlenstoff Legierungen. Leipzig, Spamer, 1919. 483 p. Bibl. footnotes. Patents listed through text.

ROSENHAIN, WALTER. An introduction to the study of physical metallurgy. New York, Van Nostrand, 1915. 368 p. Bibl. at end of chapters.

SACK, M. Bibliographie der Metalllegierungen. *Z. anorg. Chem.* 35: 249-328 (1903). Also as separate, Hamburg, Voss, 1903. 77 p. 880 references by authors, with subject index by elements.

TAMMAN, G. H. Lehrbuch der Metallographie, Chemie und Physik der Metalle und ihre Legierungen. 2nd ed. Leipzig, Voss, 1921. 402 p. Bibl. footnotes. Bibl., p. 383-385, 391-397.

YENSEN, TRYGVE. Preparation of pure alloys for magnetic purposes. *Trans. Am. Electrochem. Soc.* 32: 163-182 (1917).

See also names of metals, METALLOGRAPHY, METALLURGY.

ALLOYS: Physical Properties.

BRONIEWSKI, W. Sur les propriétés thermo-électriques des alliages. *Rev. métal.* 7: 360-367 (1910). Chronological, 1822-1909.

BRONIEWSKI, W. Sur la conductivité électrique des alliages. *Rev. métal.* 8: 328-334 (1911); *J. Soc. Chem. Ind.* 30: 550-552 (1911). Covers 1827-1910.

DREWITZ, CURT. Ueber einige physikalische Eigenschaften von Legierungen, die durch Einschmelzen und durch hohe Drucke aus Pulvern hergestellt sind. Rostock, Winterberg, 1902. 46 p. Bibl., p. 45-46.

"Erstarrungskurven binärer Legierungen." *In* Landolt-Börnstein, Tabellen, 4th ed., 1912, p. 640-697; 5th ed., 1923, p. 525-587.

GUERTLER, W. Ueber die elektrische Leitfähigkeit der Legierungen. *Z. anorg. Chem.* 51: 397-433 (1906); 54: 58-87 (1907). 80 references.

ALLOYS: Physical Properties—Cont'd

LUDWIK, P. Ueber die Härte von Metallegierungen. *Z. anorg. Chem.* 94: 161-192 (1916). Bibl. footnotes.

SMITH, ALPHEUS W. Thermal, electrical and magnetic properties of alloys. Ohio State Univ., Eng. Expt. Sta., Bull. No. 20, 1921. 177 references as footnotes and throughout text.

TAMMANN, G. Die chemischen und galvanischen Eigenschaften von Mischkristallreihen und ihre Atomverteilung. *Z. anorg. allgem. Chem.* 107: 1-239 (1919). Bibl. footnotes.

See also name of property.

ALLYL ALCOHOL

MEYER-JACOBSON. Allylalkohol. In *their* Lehrb. org. Chem. 1, pt. 1; 906-911 (1907). Bibl. footnotes.

PINCUSOHN, L. Allylalkohol. In *Abderhalden*, Biochem. Handl. 1: 483-486 (1911). 50 footnotes.

ALOES

"Aloes." Ind.-Cat. S. G. O., 1st ser., 1: 202-203 (1880); 2nd ser., 1: 271 (1896); 3rd ser., 1: 303 (1918). Includes toxicology.

ALOIN

"Alain." Ind.-Cat. S. G. O., 2nd ser., 1: 271-272 (1896); 3rd ser., 1: 303 (1918).

ALSTONITE. See CALCIUM BARIUM CARBONATE.**ALUM**

"Alum." Ind.-Cat. S. G. O., 1st ser., 1: 208 (1880); 2nd ser., 1: 282 (1896); 3rd ser., 1: 318 (1918).

See also BAKING POWDER.

ALUMINATES

MELLOR, J. W. Aluminates. In *his* Inorg. theor. chem. 5: 298-300 (1924).

ALUMINIUM

"Aluminium." Ind.-Cat. S. G. O., 1st ser., 1: 208 (1880); 2nd ser., 1: 282 (1896); 3rd ser., 1: 318 (1918). Includes toxicology.

ANDERSON, ROBERT J. Aluminium and bauxite. Mineral Ind. 30: 9-32 (1921). 45 references.

ANDERSON, ROBERT J. Metallography of aluminium. J. Franklin Inst. 187: 44-47 (1919). 61 references.

BAERWIND, E. Tonerdeverbindungen. In *Bräuer and d'Ans*, Fortschritte 1: 3256-3259 (1923). German patents.

EPHRAIM, FRITZ. Aluminium. In *Gmelin-Kraut*, Handb. anorg. Chem. 2, pt. 2: 556-698 (1909). References through text.

FONZES-DIACON, Aluminium. In *Moissan*, Chim. min. 4: 1-60 (1905). 505 footnotes.

GUILLET, LÉON. Bibliographie de l'aluminium et de ses alliages. Rev. Métal. 18: 517-526 (1921); Bull. soc. encour. ind. nat. 133: 683-762 (1921).

LANGWORTHY, C. L., and AUSTEN, P. T. The occurrence of aluminium in vegetable products, animal products and natural waters. New York, Wiley, 1904. 168 p. 671 references.

LITTLE, H. F. V. Aluminium. In *Friend*, Textbook inorg. chem. 4: 47-102 (1917). Bibl. footnotes.

MARGOTTET, M. Aluminium. In *Frémy*, Enc. chim. 3, 4^e cahier, p. 258-262 (1884).

MELLOR, J. W. Aluminium. In *his* Inorg. theor. chem. 5: 148-372 (1924). History, p. 152-153; occurrence, p. 157-160; production and preparation, p. 170-173; physical properties, p. 197-202; chemical properties, p. 223-227.

PETERS, FRANZ. Forschung und Fortschritte auf dem Gebiet der Elektrometallurgie des Aluminiums, 1906-1915. Glückauf 52: 65, 81, 111, 129, 141 (1916). Bibl. footnotes.

PHALEN, W. C. Bauxite and aluminium. U. S. Geol. Sur., Mineral Resources, 1914, pt. 1: 208-209 (1916). 46 titles, covering 1892-1910.

ROHLAND, P., and RUSS, —. Aluminiummetall. In *Abegg*, Handb. anorg. Chem. 3, pt. 1: 93-94 (1906). 63 references.

ROHLAND, P., and AEBEGG, R. Aluminiumverbindungen. In *Abegg*, Handb. anorg. Chem. 3, pt. 1: 94-96 (1906). 70 references.

ALUMINIUM: Alloys

ANDERSON, R. J. Aluminium copper alloys. Trans. Am. Electrochem. Soc. 40: 431-434 (1921). 62 references.

ANDERSON, R. J. Casting of light aluminium alloys. Iron Age 107: 433-436 (1921).

BRONIEWSKI, WITOLD. Recherches sur les propriétés électriques des alliages d'aluminium. Paris, 1911. Bibl., p. 123-139. 225 references.

MELLOR, J. W. Alloys and intermetallic compounds of aluminium. In *his* Inorg. theor. chem. 5: 243-246 (1924).

U. S. Bureau of Standards. Aluminium and its light alloys. Circular No. 76, 1919. 120 p. Bibl. p. 109-120. Also in Chem. Met. Eng. 19: 729-732, 780-785 (1918). 506 references, classified.

See also DURALUMINIUM, HEUSLER ALLOYS.

ALUMINIUM: Analytical.

BLUM, WM. Determination of aluminium as oxide. *J. Am. Chem. Soc.* 38: 1282-1292 (1916); U. S. Bur. Standards, Sci. Paper No. 286, 1916. 20 p. Bibl. footnotes.

EPHRAIM, FRITZ. Aluminium: Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 587-590 (1909).

ALUMINIUM: Galvanizing.

REGELSBERGER, F. Altes und neues ueber die Galvanisierung des Aluminiums. *Elektrochem. Z.* 19: 214-220 (1912). 56 references, including patents.

ALUMINIUM BROMIDE

EPHRAIM, FRITZ. Aluminiumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 632-635 (1909). References through text.

ALUMINIUM CHLORIDE

EPHRAIM, FRITZ. Aluminiumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 621-632 (1909). References through text.

GANGLOFF, WILMER C. The action of anhydrous aluminium chloride upon unsaturated organic compounds. Thesis, Ohio State Univ., 1917. 31 p. Bibl., p. 26-31.

MELLOR, J. W. Aluminium chloride. *In his* Inorg. theor. chem. 5: 323-324 (1924).

RALSTON, OLIVER C. Anhydrous aluminium chloride. U. S. Bur. Mines, Tech. Paper No. 321, 1923. 38 p. 81 patents given on p. 38, each of which is discussed in the text.

ALUMINIUM FLUORIDE

EPHRAIM, FRITZ. Aluminiumfluorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 618-621 (1909). References through text.

ALUMINIUM HYDROXIDE

EPHRAIM, FRITZ. Aluminiumhydroxid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 595-602 (1909). References through text.

MELLOR, J. W. Aluminium hydroxides and peroxides. *In his* Inorg. theor. chem. 5: 283-284 (1924).

ALUMINIUM NITRIDE

COUTAGNE, G. [Bibliographic notes on aluminium nitride.] *Houille blanche* 11: 299; *Rev. electrochem.* 6, 78-83.

EPHRAIM, FRITZ. Aluminiumnitrid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 602-604 (1909). References through text.

TONIOLO, C. I problemi dell'azoto: tentativi industriali della fabbricazione del nitrato di alluminio. *Giorn. chim. ind. appl.* 3: 360-368 (1921). 100 references to literature and patents.

ALUMINIUM OXIDE

EPHRAIM, FRITZ. Aluminiumoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 590-595 (1909). References through text.

MELLOR, J. W. Aluminium oxide. *In his* Inorg. theor. chem. 5: 247-272 (1924).

ALUMINIUM PHOSPHATES

EPHRAIM, FRITZ. Aluminiumphosphate. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 636-642 (1909). References through text.

LEITMEIER, H. Tonerdephosphate. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 456-526 (1918). Bibl. footnotes.

MELLOR, J. W. The aluminium phosphates. *In his* Inorg. theor. chem. 5: 371-372 (1924).

ALUMINIUM SILICATES

DOELTER, C. Aluminiumsilicate. *In his* Handb. Mineralchem. 2, pt. 2: 1-29 (1917). Bibl. footnotes.

DOELTER, C. Komplexe Silicate von Aluminium (Eisen) mit einwertigen Alkalimetallen. *In his* Handb. Mineralchem. 2, pt. 2: 193-208 (1917). Bibl. footnotes.

JACOBY, R. Aluminiumsilikate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 262-264 (1912). References through text.

SCHNEIDERHOHN, HANS. Ueber die Umbildung von Tonerdesilikaten unter dem Einfluss von Salzlösungen bei Temperaturen bis 200°. *Neues Jahrb. Min. Geol.* 40: 163-228 (1915-16). Bibl. footnotes.

STREMMER, H. Wasserhaltige Aluminiumsilicate. *In* Doelter, Handb. Mineralchem. 2, pt. 2: 30-94 (1917). Bibl. footnotes.

ALUMINIUM SULFATE

EPHRAIM, FRITZ. Aluminiumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 607-614 (1909). References through text.

MELLOR, J. W. Aluminium sulfate. *In his* Inorg. theor. chem. 5: 332-357 (1924).

ALUNDUN. See REFRACTORIES.**ALYPIN**

"Alypin." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 320-321 (1918).

AMALGAMS

ANDRÉ, G. Mercure. *In* Moissan, *Chim. min.* 5: 196-485 (1906). Bibl. footnotes.

DUDLEY, WM. L. The nature of amalgams. *Am. Assoc. Adv. Sci., Section C*, 1890, p. 145-171. "Index to the literature on amalgams," p. 161-171.

AMALGAMS—Cont'd

FENCHEL, AD. Metallurgy. London, Bale, 1911. 273 p. Bibl., p. 256-267.

GIESY, PAUL M., and WITHROW, JAMES R. Electropreparation of solid alkali amalgams in quantity. *Ind. Eng. Chem.* 15: 57-59 (1923). 23 references.

MELLOR, J. W. Amalgams. *In his Inorg. theor. chem.* 4: 1009-1010, 1020-1022, 1029-1030, 1034-1035, 1037, 1046-1048 (1923). About 750 references.

PETERS, F., and LOWENSTEIN, W. Allgemeines über Legierungen. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 404-417 (1914). For particular amalgams, *see*: Ag, 1267-1274; Al, 1109-1114; Au, 1285-1286; Ba, 1073-1078; Bi, 1168-1171; Ca, 1094-1097; Cd, 1189-1200; Ce, 1025-1027; Co, 1239-1240; Cr, 1118; Cu, 1250-1254; Fe, 1229-1232; K, 978-987; Li, 1036-1040; Mg, 1103-1105; Mn, 1147-1148; Na, 1043-1058; Ni, 1235-1236; Pb, 1218-1226; Rb, 1021-1022; Sb, 1160-1162; Sn, 1205-1213; Sr, 1085-1090; Te, 1165-1166; Th, 1215-1217; Zn, 1171-1183. References through text.

RICHARDS, THEODORE W. Electrochemical investigation of liquid amalgams of thallium, indium, tin, zinc, cadmium, lead, copper and lithium. *Carnegie Inst., Pub. No. 118.* Washington, 1909. 72 p. Bibl. footnotes.

RICHARDS, T. W., and CONANT, J. B. The electrochemical behavior of liquid sodium amalgams. *J. Am. Chem. Soc.* 44: 610-611 (1922). About 40 references.

RICHARDS, T. W., and FORBES, G. S. Energy changes involved in the dilution of zinc and cadmium amalgams. *Carnegie Inst., Pub. No. 56.* Washington, 1906. 68 p. *Z. physik. Chem.* 58: 683 (1907). Bibl. footnotes.

SMITH, G. M. Constitution of amalgams. *Am. Chem. J.* 36: 124-135 (1906). 30 footnotes.

AMIDASES

EFFRONT, J. "Amidases." *In his* Biochemical catalysts, 1917, p. 558-561. *See also* ENZYMES.

AMINES

"Amines and derivatives." *Ind.-Cat. S. G. O.*, 2nd ser., 1: 305-306 (1896); 3rd ser., 1: 340-343 (1918). Includes metabolic relations.

FRIES, A. Ueber die Einwirkung von Brom auf aromatische Amine. Substitutionsprodukte und Perbromide. *Ann.* 346: 128-219 (1906). 67 footnotes.

GUGGENHEIM, M. Biogene Amine. *In* Abderhalden, *Handb. biol. Arbeitsm.*

1, pt. 7: 295-502 (1922). Bibl. footnotes.

GUGGENHEIM, M. Die biogenen Amine. Berlin, Springer, 1920. 376 p. Bibl., p. 298-369.

GUGGENHEIM, M., and HOTTINGER, A. Die biogenen Amine im Harn. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 5, no. 3: 271-362 (1924). Bibl. footnotes.

RONA, PETER. Aliphatische Amine. *In* Abderhalden, *Biochem. Handl.* 4: 801-812 (1911). Bibl. footnotes.

WINTERSTEIN, E., and TRIER, G. Aromatische Amine. *In* Abderhalden, *Biochem. Handl.* 4: 813-817 (1911). Bibl. footnotes.

ZEMPLÉN, GÉZA. Amine. *In* Abderhalden, *Biochem. Handl.* 11: 271-294 (1924). Bibl. footnotes.

AMINO ACIDS

ABDERHALDEN, EMIL. Aliphatische und isocyclische Aminosäuren und ihre Derivate. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 1: 159-185 (1923). 86 footnotes.

ECKWEILER, HERBERT, NOYES, HELEN M., and FALK, K. GEORGE. The amphoteric properties of some amino acids and polypeptides. *J. Gen. Physiol.* 3: 291-308 (1920-21). 26 footnotes.

HIRSCH, PAUL. Die Einwirkung von Mikroorganismen auf die Eiweisskörper. Berlin, Borntraeger, 1918. 255 p. 632 footnotes.

MEYER-JACOBSON. Aminoderivative der Carbonsäuren (Aminosäuren). *In their* *Lehrb. org. Chem.* 1, pt. 2: 729-798 (1913). Bibl. footnotes.

NEUBAUER, OTTO. Abbau der Aminosäuren im Organismus. *In* Abderhalden, *Biochem. Handl.* 4: 360-390 (1911). 220 references.

SCHIEBLER, HELMUTH. Aliphatische Aminosäuren. *In* Abderhalden, *Biochem. Handl.* 4: 391-760 (1911); 9: 65-165 (1915). Many hundred footnotes.

SCHULZE, E., and WINTERSTEIN, E. Ueber die bei der Spaltung der Eiweisssubstanzen entstehenden basischen Produkte. *Ergeb. Physiol.* 1: 32-35 (1902). 72 references.

TRIER, GEORG. Abbau- und Aufbauversuche auf dem Gebiete der methylierten Aminosäuren. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 7: 533-552 (1922). Bibl. footnotes.

TRIER, GEORG. Nachweis, Darstellung und Bestimmung methylierter Aminosäuren und Betaine in Tier- und Pflanzengewebe. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 7: 503-532 (1922). Bibl. footnotes.

- UNDERHILL, FRANK P. The physiology of the amino acids. New Haven, Yale Univ. Press, 1915. 169 p. Bibl. at end of chapters.
- WASER, ERNST B. H. Biologisch wichtige Aminosäuren die im Eiweiss nicht vorkommen. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 7: 567-778 (1922). Bibl. footnotes. *See also* Abderhalden, Biochem. Handl. 11: 320-464 (1924). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Aminosäuren. In Abderhalden, Biochem. Handl. 11: 47-201 (1924). Bibl. footnotes.
- See also* names of the individual acids, PROTEINS, ETC.
- AMINO ALCOHOLS**
- MEYER-JACOBSON. Aminoalkohole, deren Äther und Ester. In *their* Lehrb. org. Chem. 1, pt. 2: 265-280 (1913). Bibl. footnotes.
- AMMONIA**
- "Ammonia, including compounds." Ind.-Cat. S. G. O., 1st ser., 1: 234-236 (1880); 2nd ser., 1: 307-309 (1896); 3rd ser., 1: 344-346 (1918). Includes toxicology.
- BERTELSMANN, W. Ammoniak und seine Verbindungen. In Brauer and d'Ans, Fortschritte, 1: 1671-1679 (1922). German patents.
- BRAUN, J. v. Ammoniak. In Abegg, Handb. anorg. Chem. 3, pt. 3: 52-87 (1907). 210 references.
- CRAGOE, CARL S., McKELVEY, E. C., and O'CONNOR, G. F. Specific volume of saturated ammonia vapor. U. S., Bur. Standards, Sci. Paper No. 467, 1923, 29 p. Bibl., p. 735.
- CRAGOE, CARL S., MEYER, CYRIL H., and TAYLOR, CYRIL S. Vapor pressure of ammonia. U. S. Bur. Standards, Bull. 16: 1-35 (1920); Sci. Paper No. 369, 37 footnotes.
- FRANKLIN, E. C. The ammonia system of acids, bases and salts. Am. Chem. J. 47: 285-317 (1912). Bibl. footnotes.
- GOODENOUGH, G. A., and MOSHER, WM. EARL. Properties of saturated and superheated ammonia vapor. Univ. Ill., Eng. Expt. Sta., Bull. No. 66, 1913, 94 p. 86 references on p. 92-94.
- HOLST, G. Equation of state... of ammonia and methyl chloride. Assoc. int. froid, Bull. 6: 69-70 (1915). 61 references.
- JURISCH, K. W. [Ammonia.] In *his* Salpeter und sein Ersatz, 1908, p. 197-227. Covers 1830-1908.
- KRASSA, P., and d'ANS, J. Ammoniasynthese. In Brauer and d'Ans, Fortschritte 1, 1616-1617 (1922). 57 German patents.
- McKELVEY, E. C. Composition and testing of commercial liquid ammonia. J. Am. Soc. Refrig. Eng. 3: 48 (1917). 23 references, 1892-1916.
- McKELVEY, E. C., and TAYLOR, C. S. Composition, purification and certain constants of ammonia. U. S., Bur. Standards, Sci. Paper No. 465, 1923. Bibl., p. 691-693. *Also in* Refrig. Eng. 9: 213-225 (1923). 60 footnotes.
- MAURER, EDUARD. Berechnungen zum Ammoniakgasgleichgewicht. Z. anorg. allgem. Chem. 108: 273-302 (1919). Bibl. footnotes.
- SCHLENK, W. Ammoniak. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 196-224 (1907). References through text.
- SCHUCHART, G. Die technische Gewinnung von Stickstoff, Ammoniak und schwefelsaurem Ammonium. Sammlung chem. chem.-tech. Vorträge 25: 240-260 (1919). Patents.
- SPIEGEL, LEOPOLD. Ammoniak. In *his* Der Stickstoff, 1903, p. 378-426. Bibl. footnotes.
- URBAIN, M. Ammoniaque. In Frémy, Enc. chim. 2, 1^e cahier: 442-444 (1885).
- See also* ACIDS, ALKALIS, SALTS; COAL TAR (Lunge); NITROGEN; ETC.
- AMMONIA: Analytical.** *See* NITROGEN, ANALYTICAL.
- AMMONIA: Oxidation.**
- BOYCE, JOHN C. Bibliography of the production of synthetic nitric acid and synthetic ammonia. Chem. Met. Eng. 17: 328-337 (1917).
- DONATH, E. [Production of nitric acid from ammonia.] Z. ges. Schiess-Sprengstoffw. 11: 170-172 (1916). Patents.
- DONATH, EDWARD, and INDRA, A. Die Oxydation des Ammoniak zu Salpetersäure und salpetriger Säure. Sammlung chem. chem.-tech. Vorträge 19: 143-250 (1913). Bibl. footnotes.
- See also* NITROGEN FIXATION.
- AMMONIA: Physiological.**
- ALBERTONI, PIETRO. Die physiologische Bedeutung von Ammoniak. Ergeb. Physiol. 19: 594-597 (1921). 74 references.
- IVERSEN, POUL. Experimentelle undersøgelser over ammoniums forhold i organismen, dets indvirkning paa denne og dets udskillelsesforhold. Thesis, Copenhagen, 1918. 139 p. Bibl., p. 136-139.
- AMMONIFICATION.** *See* NITRIFICATION.

AMMONIUM ACETATE

GUTHIER, A. Ammoniumacetate. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 769-775 (1911).

AMMONIUM AMALGAMS. *See* AMALGAMS.**AMMONIUM BICARBONATE**

WEGSCHEIDER, R. Teschemacherit. *In* Doelter, Handb. Mineralchem. 1: 209-212 (1912). 35 footnotes.

See also AMMONIUM CARBONATE.

AMMONIUM BROMIDE

DITZ, HUGO. Ammoniumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 268-271 (1909). References through text.

MELLOR, J. W. Ammonium bromide. *In his* Inorg. theor. chem. 2: 590-596 (1922). 100 references.

AMMONIUM CARBONATE

GUTHIER, A. Ammoniumkarbonate. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 753-768 (1911). References through text.

MELLOR, J. W. Ammonium carbonate. *In his* Inorg. theor. chem. 2: 780-791 (1922). 200 references.

TERRES, ERNST, and WEISER, HANS. Beitrag zur Kenntniss der Ammonia-Kohlensäureverbindungen in Gleichgewicht mit ihren wässerigen Lösungen. *Z. Elektrochem.* 27: 177-193 (1921). Bibl. footnotes.

AMMONIUM CHLORIDE

DITZ, HUGO. Ammoniumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 169-181 (1909). References through text.

HIBERT, A. Chlorure d'ammonium. *In* Moissan, Chim. min. 3: 210-214 (1904). 55 footnotes.

MELLOR, J. W. Ammonium chloride. *In his* Inorg. theor. Chem. 2: 561-577 (1922). 400 references.

AMMONIUM CYANIDE

GUTHIER, A. Ammoniumcyanid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 749-753 (1911). References through text.

AMMONIUM FLUORIDE

MELLOR, J. W. Ammonium fluoride. *In his* Inorg. theor. chem. 2: 519-521 (1922). 25 references.

AMMONIUM IODIDE

MELLOR, J. W. Ammonium iodide. *In his* Inorg. theor. chem. 2: 615-621 (1922). 75 references.

AMMONIUM NITRATE

JURISCH, K. W. [Ammonium nitrate.] *In his* Salpeter und sein Ersatz, 1908, p. 107-112.

MELLOR, J. W. Ammonium nitrate. *In his* Inorg. theor. chem. 2: 829-846 (1922). 200 references.

OELKER, A. Verfahren zur Herstellung von Ammoniumnitrat. *Z. ges. Schiess-Sprengstoffw.* 9: 80-83 (1914). Chronological list of patents from 1888 to 1912.

SCHLENK, W. Ammoniumnitrat. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 322-326 (1907). References through text.

See also AMMONIA (Bertelsmann), NITRIC ACID (Cottrell).

AMMONIUM OXALATE

GUTHIER, A. Ammoniumoxalate. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 775-783 (1911). References through text.

AMMONIUM PHOSPHATES

MELLOR, J. W. Ammonium phosphates. *In his* Inorg. theor. chem. 2: 871-879 (1922). 100 references.

AMMONIUM SALTS

PICK, —. Ammoniumsalze. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 346-360 (1907). 794 references.

VILLIERS, M. A. Ammonium, sels ammoniacaux. *In* Frémy, Enc. chim. 3, 3^e cahier: 141-144 (1884).

WALKER, A. J. Ammonium compounds. *In* Friend, Textbook 2: 211-241 (1924). Bibl. footnotes.

AMMONIUM SULFATE

LINNE, BR. Ammoniumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 651-665 (1907). References through text.

MELLOR, J. W. Ammonium sulfate. *In his* Inorg. theor. Chem. 2: 694-710 (1922). 250 references.

WAY, A. B. Bibliography of ammonium sulfate. *Proc. Am. Gas. Inst.* 6: 223-227 (1911). 70 references.

See also AMMONIA (Bertelsmann, Schuchart).

AMMONIUM SULFIDES

LINNE, BR. Ammoniumsulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 625-639 (1907). References through text.

MELLOR, J. W. Ammonium sulfides. *In his* Inorg. theor. chem. 2: 645-655 (1922). 100 references.

AMMONIUM SULFITE

LINNE, BR. Ammoniumsulfit. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 647-651 (1907). References through text.

AMMONIUM SULFOCARBONATE

GUTHIER, A. Ammoniumsulfokarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 791-793 (1911). References through text.

AMMONIUM TARTRATE

GUTHIER, A. Ammoniumsalze der Weinsäure. *In* Gmelin-Kraut, Handb.

- anorg. Chem. 1, pt. 3: 784-789 (1911). References through text.
- AMMONIUM THIOCYANATE**
GUTBIER, A. Ammoniumrhodanid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 803-809 (1911). References through text.
- AMMONIUM TRINITRIDE**
BROWNE, H. A., and HOULEHAN, A. E. Action of ammonium trinitride on certain metals. *J. Am. Chem. Soc.* 33: 1742-1752 (1911). 50 references.
- AMMONIUM TUNGSTATE**
KIESER, A. J. Ammoniumwolframate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 739-745 (1912). References through text.
- AMMONO CARBONIC ACIDS**
FRANKLIN, E. C. The ammono carbonic acids. *J. Am. Chem. Soc.* 44: 486-509 (1922). 50 references.
- AMNIOTIC FLUID**
UYENO, DOKO. Physical properties and chemical composition of human amniotic fluid. *J. Biol. Chem.* 37: 77 (1919). 37 references.
- WOLFF, BRUNO. Fruchtwasser. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 709-741 (1910). 91 footnotes.
- AMPHOTERIC ELECTROLYTES.** *See* ELECTROLYTES.
- AMYGDALIN**
EULER, H., and LUNDBERG, J. Amygdalin. *In* Abderhalden, Biochem. Handl. 2: 707-711 (1911); 8: 356-359 (1914). 85 footnotes.
- ZEMPLÉN, GÉZA. Amygdalin. *In* Abderhalden, Biochem. Handl. 10: 892-897 (1923). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Amygdalin. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 5: 1016-1017 (1922). 50 references.
- AMYL ACETATE**
WORDEN, E. C. Amyl acetate. *In his* Technology of cellulose esters 1: 2486-2496 (1921). Bibl. footnotes.
- AMYL ALCOHOL**
GERNGROSS, OTTO. Normaler Amylalkohol. *In* Abderhalden, Biochem. Handl. 1: 442-444 (1911). Bibl. footnotes.
- MEYER-JACOBSON. Amylalkohole. *In their* Lehrb. org. Chem. 1, pt. 1: 238-243 (1907). Bibl. footnotes.
- WORDEN, E. C. Amyl alcohol. *In his* Technology of cellulose esters 1: 2446-2486 (1921). Bibl. footnotes. Includes industrial applications.
- AMYL FORMATE**
WORDEN, E. C. Amyl formate. *In his* Technology of cellulose esters 1: 2496-2497 (1921). Bibl. footnotes.
- AMYLASE**
"Amylase." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 373-374 (1918).
- HARTER, L. L. Amylase of *Rhizopus tritici*, with a consideration of its secretion and action. *J. Agr. Res.* 20: 784-786 (1921).
- LÜERS, HEINRICH, and WASMUND, WILHELM. Über die Wirkungsweise der Amylase. *Fermentsforschung* 5: 169-235 (1921-22). Bibl. footnotes.
- MOHR, D., and KLOSS, R. Die Arbeiten über Amylase in den letzten 10 Jahren. *Woch. Brauerei* 30: 429-433, 439-440, 448-450 (1913). 111 footnotes.
- SHERMAN, H. C., *et al.* Studies on amylases. *J. Am. Chem. Soc.* 32: 1073-1086, 1087-1103; 33: 1195-1204; 34: 1104-1110; 35: 1617-1623, 1784-1790, 1790-1794; 37: 623-643, 643-648, 1305-1319 (1912-1915). Bibl. footnotes.
- WATANABE, C. K. Studies on animal diastases. Effect of the administration of various substances on the blood diastase of rabbits. *Am. J. Physiol.* 45: 30-43 (1917). 40 references.
- ZUNZ, EDGARD. Amylase. *In* Abderhalden, Biochem. Handl. 5: 551-560 (1911). About 250 footnotes.
- See also* ENZYMES.
- AMYL BENZENE**
BYGDEN, ARTUR. [Physical properties of amylbenzene.] *Ber.* 45: 3483 (1912). 25 references.
- See also* HYDROCARBONS.
- AMYLENE**
"Amylene." *Ind.-Cat. S. G. O.*, 1st ser., 1: 279 (1880); 2nd ser., 1: 337-338 (1896); 3rd ser., 1: 374 (1918).
- See also* HYDROCARBONS.
- AMYL NITRITE**
"Nitrite of amyl." *Ind.-Cat. S. G. O.*, 1st ser., 1: 278-279 (1880); 2nd ser., 1: 337 (1896); 3rd ser., 1: 373 (1918).
- ANALCIM**
JACOBY, R. Analcim. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 274-277 (1912). References through text.
- ANALYTICAL CHEMISTRY**
BOLTON, H. C. Bibliography of analytical chemistry for 1886-1892. *J. Anal. Chem.* 1: 277-280 (1887); 2: 63-67 (1888); 3: 403-410 (1889); 4: 48-53 (1890); 5: 145-151 (1891); 6: 61-71 (1892); 7: 19-26 (1893). Books and new journals only.

ANALYTICAL CHEMISTRY—Cont'd

BREARLEY, HARRY, and IBBOTSON,

FRED. Analysis of steel works materials. New York, Longmans, 1902. 501 p. Bibl. of 1858 references, p. 359-495. Most important subjects are: C, 193 references; Si, 104; Mn, 245; S, 186; P, 220; Cr, 140; Ni, 115; Co, 70; Mo, 40; Fe, 112; W, 72; V, 65; Ti, 57; Al, 67; Cu, 165.

BRUNCK, O. Fortschritte auf dem Gebiete der Metallanalyse. Chem.-Ztg. 26: 515-520 (1902); 66 footnotes. 27: 399-403 (1903); 75 references. 28: 510-514 (1904); 69 references. 29: 856-861 (1905); 80 references. 30: 777-780 (1906); 75 references. 31: 567-570 (1907); 56 footnotes. 32: 562-564 (1908); 71 references.

CHEMICAL SOCIETY. Analytical chemistry. In Annual Reports on the Progress of Chemistry, vol. 1+-1904 to date. Numerous footnotes in each volume refer to the more important articles appearing each year.

CUMMING, ALEX. C., and KAY, S. A. Textbook of quantitative chemical analysis. 4th ed. London, Gurney, 1922. 432 p. "General references," p. 421-424.

DORING, TH. Fortschritte auf dem Gebiete der Metallanalyse, 1908-1923. Chem.-Ztg. 33: 809, 818, 826 (1909); 105 footnotes. 34: 729, 746, 759 (1910); 104 footnotes. 35: 785, 802, 821, 840 (1911); 105 footnotes. 36: 681, 737, 759 (1912); 104 footnotes. 37: 961, 1018, 1046 (1913); 103 footnotes. 38: 893, 965, 993, 1006 (1914); 107 footnotes. 39: 725, 734 (1915); 77 footnotes. 40: 817, 830, 855 (1916); 77 footnotes. 41: 633, 650 (1917); 85 footnotes. 43: 545, 578, 601, 626, 653, 682 (1919); 221 footnotes. 44: 893, 933, 961, 967 (1920); 122 footnotes. 45: 1217, 1250 (1921); 89 footnotes. 46: 937, 981, 1021, 1046, 1069 (1922); 140 footnotes. 47: 605, 622, 630, 650, 666, 675, 689, 694 (1923); 174 footnotes. 48: 525, 557, 589, 609, 634, 677, 747, 777, 786 (1924); 204 footnotes.

FURMAN, N. HOWELL. Electrometric methods in analytical chemistry. In Taylor, Treatise on physical chemistry 2: 823-863 (1924). Bibl. footnotes.

GRIFFIN, ROGER C. Technical methods of analysis as employed in the laboratories of Arthur D. Little, Cambridge, Mass. New York, McGraw, 1921. 666 p. Bibl., p. 627-633. Books only.

GROSSMANN, H. Analytische Chemie. Fortschritte Chem. 5: 87-97 (1912). References through text.

GROSSMANN, H., and STERN, E. Analytische Chemie. Fortschritte Chem. 1: 134-145 (1909). References through text.

GUTBIER, A. Analytische Chemie der Metalloide. 1900-1915. Chem.-Ztg. 34: 985, 1007, 1017, 1029, 1038 (1910); 207 footnotes. 35: 229-230 (1911); 21 footnotes. 36: 53, 66, 94 (1912); 86 footnotes. 37: 205, 223, 239, 278, 290 (1913); 99 footnotes. 38: 185, 195, 226, 291, 307 (1914); 136 footnotes. 39: 597, 622, 635, 650, 675 (1915); 168 footnotes. 40: 245, 276, 303, 315, 326 (1916); 117 footnotes.

GUTBIER, A., and MÜLLER, A. Fortschritte auf dem Gebiete der analytischen Chemie der Metalloide, 1916-1920. Chem.-Ztg. 45: 853, 878, 902, 950, 974, 978, 1022, 1046, 1053 (1921); 362 footnotes.

HUYBRECHTS, M. Revue des travaux de chimie analytique minérale, 1906-1913. Bull. soc. chim. Belg. 21: 333-350 (1907); bibl. footnotes. 22: 367-389 (1908); 69 footnotes. 23: 346-366 (1909); 61 footnotes. 24: 283-302, 313-326 (1910); 107 footnotes. 25: 328-352 (1911); 74 footnotes. 26: 435-463 (1912); 82 footnotes. 27: 252-273 (1913); 79 footnotes. 28: 276-287, 314-330 (1914-19); 122 footnotes.

KINDSCHER, E. Analytische Chemie. Fortschritte Chem. 7: 17-30 (1913); 9: 95-108 (1914); 11: 119-131 (1914-15); 13: 33-44, 189-198 (1917-18); 14: 97-110 (1918-19). References through text.

KLING, A., and LASSIEUR, A. Revue de chimie analytique. Chimie & Industrie 4: 151-164, 457-466 (1920); 6: 746-764 (1921); 7: 34-48 (1921); 10: 30-48, 221-244 (1923). Bibl. footnotes.

MEDICUS, L. Bericht ueber Fortschritte der analytischen Chemie. 1902-1904. Chem.-Z. 3: 8-11, 193-196, 424-426, 445-446, 732-735 (1903-1904); 4: 245-249, 532-534 (1905). 550 footnotes.

MEYER, HANS J. L. Analyse und Konstitutionsermittlung organischer Verbindungen. 4th ed. Berlin, Springer, 1922. 1191 p. Bibl. footnotes.

MOORE, RICHARD B., et al. Analytical methods for certain metals including cerium, thorium, molybdenum, tungsten, radium, uranium, vanadium, titanium and zirconium. U. S. Bur. Mines, Bull. No. 212, 1923. 325 p. Contains various bibl.

MUSATTY, I. I progressi dell'analisi elettrolitica nell'anno 1913. *Ann. chim. appl.* 2: 172-188 (1914). 100 footnotes.

ROSENKRANZ, W. *Analytische Chemie. Fortschritte Chem.* 3: 173-186, 385-400 (1910-11). References through text.

ROSENTHALER, L. *Der Nachweis organischer Verbindungen. Ausgewählte Reaktionen und Verfahren.* Stuttgart, Enke, 1914. 1070 p. Bibl. footnotes.

SHERMAN, HENRY C. *Methods of organic analysis.* 2nd ed. New York, Macmillan, 1912. 407 p. Bibl. footnotes and bibl. at end of each chapter.

SOCIETY OF CHEMICAL INDUSTRY. *Analytical chemistry. In Annual reports on the progress of applied chemistry*, 4: 574-592 (1919); 107 footnotes. 5: 566-580 (1920); 95 footnotes.

STERN, E. *Analytische Chemie. Fortschritte Chem.* 2: 39-48 (1910). References through text.

WALLIS, T. E. *Analytical microscopy.* New York, Longman, 1923. 149 p. Bibl., p. 139-143.

WHITMAN, J. L. *Bibliography on electrometric determinations. In Popoff, Quantitative analysis* (Philadelphia, Blakiston's, 1924), p. 309-321.

Serial

Analyst; the journal of the Society of Public Analysts and other analytical chemists. London. 1877-. Classified as follows: Food and drug analysis; biochemical, bacteriological, etc.; water analysis; agricultural analysis; organic analysis; physical methods, apparatus, etc.; toxicological and forensic; book reviews.

Annales de chimie analytique et de chimie appliquée et revue de chimie analytique réunies. 1890-. Each number contains "Revue des publications françaises et étrangères."

Annales des falsifications et des fraudes. Organe officiel de la "Société des experts-chimistes de France." Paris. Each number contains "Index bibliographique." Classified.

Chemical abstracts. See Part II.

Zeitschrift für analytische Chemie. Wiesbaden. 1862-. Classification: General analytical chemistry; inorganic analysis; organic analysis; elementary, qualitative and quantitative; special methods; biological materials; industrial; pharmacy.

The school of mines quarterly. 1880-1915. Each volume contains abstracts on analytical chemistry.

See also CATALYSIS (Woker); names of various compounds; special reagents, such as CUPFERRON, HYDRAZINE; ELECTRO-ANALYSIS; SPECTROSCOPE; STOICHIOMETRY.

ANALYTICAL CHEMISTRY: Microchemistry.

EMICH, FRIEDRICH. *Lehrbuch der Mikrochemie.* Wiesbaden, Bergmann, 1911. 212 p. Bibl. footnotes; p. 65-77 contain special tests for anions and cations with references.

EMICH, FRIEDRICH. *Mikrochemisches Praktikum. Eine Anleitung zur Ausführung der wichtigsten mikrochemischen Handgriffe, Reaktionen und Bestimmung.* München, Bergmann, 1924. 177 p. Bibl. footnotes.

EMICH, F. *Über Mikrochemie, mit besonderer Berücksichtigung der Arbeiten von H. Behrens.* Ber. 43: 10-45 (1910). About 160 footnotes.

EMICH, F. *Ueber die Fortschritte der Mikrochemie seit H. Behrens.* Chem.-Ztg. 35: 637-639, 663-665 (1911). 64 footnotes.

EMICH, F. *Ueber die Fortschritte der Mikrochemie, 1911-1914.* Chem.-Ztg. 37: 1461, 1494, 1502, 1522 (1913); 159 footnotes. 39: 789, 838 (1915). 159 footnotes.

MACALLUM, A. B. *Die Methode und Ergebnisse der Mikrochemie in der biologischen Forschung.* *Ergeb. Physiol.* 7: 552-562 (1908). 246 titles.

ANALYTICAL CHEMISTRY: Thermal.

KREMANN, R. *Ueber die Anwendung der thermische Analyse zum Nachweis chemischer Verbindungen.* *Sammlung chem. chem.-tech. Vorträge* 14: 213-288 (1909). Bibl. footnotes.

ANAPHYLAXIS

"Anaphylaxis." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 434-448 (1918).

BOUGHTON, T. HARRIS. *Anaphylaxis and allied phenomena in relation to disease.* *J. Lab. Clin. Med.* 5: 579-608 (1920). 118 references.

DOERR, R. *Der gegenwärtige Stand der Lehre von der Anaphylaxie.* *Z. Immunität.* II, 2: 124-132 (1910). 232 titles.

LONGCOPE, WARFIELD T. *Anti-anaphylaxis and desensitization.* *Physiol. Rev.* 3: 240-274 (1923). 156 references.

LONGCOPE, WARFIELD T., and MACKENZIE, GEORGE M. *Anaphylaxis, hypersensitiveness and protein intoxication.* *In Barker, Endocrinology and metabolism*, 4: 197-236; references, 5: 511-694 (1922).

ANAPHYLAXIS—Cont'd

LUMIERE, AUGUSTE. Rôle des colloïdes chez les êtres vivants. Essai de bio-colloïdologie. Paris, Masson, 1921. 311 p. Bibl., p. 155-283.

MICHAELIS, LEONOR. Anaphylaxie. In Oppenheimer, Handb. Biochem. 2: 689-715 (1908). 52 footnotes.

SELIGMANN, ERICH. Anaphylaxie. In Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, 248-326. 457 footnotes.

WELLS, H. G. Anaphylaxis or allergy. In *his* Chemical pathology, 4th ed., 191-203 (1920). 70 footnotes.

ANATAS

HAAS, G. Anatas. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 35-36 (1912). References through text.

HENGLEIN, M. Anatas. In Doelter, Handb. Mineralchem. 3, pt. 1: 28-33 (1918). Bibl. footnotes.

ANDESIN

DOELTER, C. Andesin. In Doelter, Handb. Mineralchem. 2, pt. 3: 237-254 (1921). 131 analyses with references.

ANEMIA: Pernicious.

SQUIER, THEODORE L. Chemistry of pernicious anemia. J. Lab. Clin. Med. 2: 552-569 (1917). 82 references.

ANESTHETICS

"Anesthetics." Ind.-Cat. S. G. O., 1st ser., 1: 285-295 (1880); 2nd ser., 1: 349-363 (1896); 3rd ser., 1: 426-431 (1918). Includes history of anesthetics, local anesthetics and uses. See also the heading "ANESTHESIA" in the same volumes.

BASKERVILLE, CHARLES. Chemistry of anesthetics. J. Franklin Inst. 172: 113-141 (1911). 43 footnotes.

BOCK, FRANZ. Experimentelle Untersuchungen ueber die Folgen der langandauernden Chloroform-Narkosen. Wiesbaden, Isselbacher, 1910. 99 p. Bibl., p. 97-99.

BRUNN, MAX VON. Die Allgemein-narkose. Stuttgart, Enke, 1913. 477 p. Bibl., p. 417-477.

GWATHMEY, JAMES T. Anesthesia. 2nd ed. New York, Macmillan, 1924. 799 p. Contains bibliographies.

HAAS, A. R. C. Effect of anesthetics upon respiration. Bot. Gaz. 67: 402-404 (1919). 31 titles.

See also CHLOROFORM, ETHYL CHLORIDE, ETHYL ETHER, ETC.

ANETHOL

EINBECK, H. Anethol. In Abderhalden, Biochem. Handl. 1: 598-603 (1911). 100 footnotes.

MEYER-JACOBSON. Anethol. In *their* Lehrb. org. Chem. 2, pt. 1: 432-433 (1896). 26 references.

ANGELIC ACID

TALBOT, HENRY P. An index to the literature of angelic and tiglic acids from 1842-1892. Tech. Quarterly 5: 80-103 (1892). 85 references. Literature discussed in text.

ANHALONIUM

"Anhalonium." Ind.-Cat. S. G. O., 2nd ser., 1: 489 (1896); 3rd ser., 1: 539 (1918). 22 references.

See also ALKALOIDS.

ANILINE

"Aniline." Ind.-Cat. S. G. O., 1st ser., 1: 421-422 (1880); 2nd ser., 1: 490-491 (1896); 3rd ser., 1: 539-540 (1918).

BAUM, FRITZ. Anilin. In Abderhalden, Biochem. Handl. 1: 207-215 (1911). 140 references.

GIBBS, H. D. The compounds which cause the red coloration of aniline. I. H. Philipp. J. Sci. 5: 9-16, 419-435 (1910). 50 footnotes.

MEYER-JACOBSON. Das Anilin und seine Derivate. In *their* Lehrb. org. Chem. 2, pt. 1: 164-218 (1895). Bibl. footnotes.

ANIMAL PIGMENTS. See PIGMENTS.**ANIMAL POISONS. See POISONS.****ANIMAL TOXINS. See TOXINS.****ANISALDEHYDE**

WITTE, E. Anisaldehyd. In Abderhalden, Biochem. Handl. 1: 833-836 (1911). 60 footnotes.

ANORTHIT. See GRANITE.**ANTHELMINTICS**

"Anthelmintics." Ind.-Cat. S. G. O., 1st ser., 1: 436-437 (1880); 2nd ser., 1: 507 (1896).

CAINS, J. F., and MHASKAR, K. S. Chemical composition of anthelmintics. Indian J. Med. Research 7: 461-463 (1919). 47 references.

HALL, MAURICE C., and SHILLINGER, J. E. Miscellaneous tests of carbon tetrachloride as an anthelmintic. J. Agr. Res. 23: 191-192 (1923).

RANSOM, B. H., and HALL, M. C. The action of anthelmintics on parasites located outside of the alimentary canal. U. S., Dept. Agr., Bur. Animal Ind., Bull. No. 153, 1912. 23 p.

ANTHOCYANS

BUSCALIONO, L., and POLLACCI, G. [Anthocyanin and its biological significance in plants.] Atti Ist Bot. Univ. Pavia, ser. 2, 8: 135-511 (1904). About 1000 references.

ONSLow, MURIEL WHELDALe. The anthocyanin pigments of plants. Cambridge, Univ. Press, 1916. 318 p. Bibl., p. 227-304.

WHELDALe, M. Nature of anthocyanin. Proc. Cambridge Phil. Soc. 15: 137-168 (1909).

See also PLANT PIGMENTS.

ANTHRACENE

AUERBACH, G. Das Anthracen und seine Derivate für Technik und Wissenschaft. Braunschweig, Vieweg, 1880. Bibl., p. 231-275. Arranged by compounds.

BAUM, FRITZ. Anthracen. In Abderhalden, Biochem. Handl. 1: 344-352 (1911). 123 references.

MEYER-JACOBSON. Anthracen. In *their* Lehrb. org. Chem. 2, pt. 2: 512 (1903). 50 references.

ANTHRANIL

BAMBERGER, EUG. Weiteres ueber Anthranil und Methyl-anthranil. Ber. 48: 537-582 (1915). Bibl. footnotes.

HELLER, GUSTAV. Ueber die Konstitution des Anthranils. J. prakt. Chem. 185: 145-164 (1908). Bibl. footnotes.

HELLER, GUSTAV. Ueber die Konstitution des Anthranils. Sammlung chem. chem.-tech. Vorträge 23: 327-410 (1917). Bibl. footnotes.

MEYER-JACOBSON. Anthranil. In *their* Lehrb. org. Chem. 2, pt. 3: 514-518 (1916). Bibl. footnotes.

ANTHRANILIC ACID

DOHRN, M., and THIELE, A. Anthranilsäure. In Abderhalden, Biochem. Handl. 1: 1203-1207 (1911). Bibl. footnotes.

ANTHRAQUINONE

GRANDMOUGIN, EUG. La chimie de l'antraquinone. *Chimie & Industrie* 7: 627-633, 879-885; 8: 47-56 (1922). Bibl. footnotes and tabular references. About 100 in all.

ANTHRAQUINONE SULFONIC ACID

GOLDBERG, IRMA, and FRIEDMANN, HERMANN. Die Sulfosäuren des Anthrachinons und seiner Derivate. Berlin, Waidmannsche Buchhandlung, 1909. 46 p. Literature and patents listed opposite each compound.

ANTIGENS

LASSEUR, A. PHILIPPE, and SPILLMANN, L. Réactions anticorps. Étude quantitative de la fixation de l'alexine. Paris, Maloine, 1921 "Index bibliographique": fasc. 1, p. 199-211.

SACHS, HANS. Antigene und Antikörper, unter besonderer Berücksichtigung der Toxinwirkung und der antitoxischen Immunität. In Oppenheimer, Handb. Biochem. 2: 275-353 (1908). 296 footnotes.

WEICHARDT, W. Antigene und Antikörper. In Abderhalden, Biochem. Handl. 5: 510-537 (1911). Bibl. footnotes.

ANTIMONY

"Antimony and compounds." Ind.-Cat. S. G. O., 1st ser., 1: 444-449

(1880); 2nd ser., 1: 537-539 (1896); 3rd ser., 1: 598-599 (1918).

EPHRAIM, F. Antimon. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 643-851 (1908). References through text.

GR. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Antimony. (1913-1919). London, H. M. S. Off., 1921. 34 p. Bibl., p. 31-34.

GROSCHUFF, E. Reines Antimon. Z. anorg. allgem. Chem. 103: 164-188 (1918). Bibl. footnotes.

GUNTZ, M. Antimoine. In Frémy, Enc. chim. 3, 11^e cahier: 403-412 (1884).

LEBEAU, P. Antimoine. In Moissan, Chim. min. 2: 1-54 (1905). 845 footnotes.

MICHEL, H. Gediegen Antimon. In Doelter, Handb. Mineralchem. 3, pt. 1: 743-756 (1918). Bibl. footnotes.

SCHENK, —. Antimon und seine Verbindungen. In Abegg, Handb. anorg. Chem. 3, pt. 3: 623-627 (1907). Classified.

U. S. TARIFF COMMISSION. Antimony. In its Tariff information survey, No. 21, p. 44-46 (1920). 55 references.

WANG, CHUNG YU. Antimony, its history, chemistry, mineralogy, geology, metallurgy, uses, preparation, analysis, production and valuation; with complete bibliographies. 2nd ed. London, Griffin, 1919. 217 p. 674 references. 1817-1908.

WANG, CHUNG YU. Bibliography of antimony from 1909-1917. Shanghai, Commercial Press, 1917. 26 p. 250 references. Continuation of the above bibl.

ANTIMONY: Analytical.

DARLING, ELTON R. A bibliography on the analysis of antimony. Chem. Engr. 27: 11-12, 21, 41-42, 63 (1919). 160 references.

EPHRAIM, F. Antimon: Analytisches. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 664-667 (1908). Classified.

WÖBLING, H. Die Bestimmungsverfahren des Arsens, Antimons und Zinns und ihre Trennung von anderen Elementen. Stuttgart, Enke, 1914. 377 p. Bibl. footnotes.

ANTIMONY: Organic Compounds.

MORGAN, GILBERT T. Organic compounds of arsenic and antimony. New York, Longmans, 1918. 375 p. Bibl., p. 351-360. 200 references.

ANTIMONY: Pharmacological.

SCHMIDT, HANS. Antimon in der neueren Medizin. Beihefte, Arch. Schiffs-Tropen-Hyg. 26, No. 1: 13-68 (1922). Classified with author index.

ANTIMONY CHLORIDES

EPHRAIM, F. Antimonpentachlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 743-750 (1908). References through text.

EPHRAIM, F. Antimontrichlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 736-743 (1908). References through text.

ANTIMONY OXIDES

EPHRAIM, F. Antimonpentoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 688-696 (1908). References through text.

EPHRAIM, F. Antimontrioxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 678-688 (1908). References through text.

MICHEL, H. Antimonoxyde. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 756-765 (1918). Bibl. footnotes.

ANTIMONY SULFIDES

EPHRAIM, F. Antimonpentasulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 717-727 (1908). References through text.

EPHRAIM, F. Antimontrisulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 698-716 (1908). References through text.

ANTIPIRETTICS

"Antiphlogistics and antipyretics." *Ind.-Cat. S. G. O.*, 1st ser., 1: 449-450 (1880); 2nd ser., 1: 539-541 (1896); 3rd ser., 1: 600-601 (1918).

KEBLER, LYMAN F., MORGAN, F. P., and RUPP, P. The harmful effects of acetanilid, antipyrin and phenacetin. *U. S. Dept. Agr., Bur. Chem., Bull. No. 120*, 1909. 85 p. Bibl., p. 21-85.

ANTIPIRYNE

"Antipyrine." *Ind.-Cat. S. G. O.*, 2nd ser., 1: 541-546 (1896); 3rd ser., 1: 601-603 (1918). Includes toxicology.

ECCLES, DAVID C. Antipyrin and its derivatives. *School of Mines Quart.* 22: 297-302 (1901). Covers period 1884-1900.

MEYER-JACOBSON. Antipyrin. *In their Lehrb. org. Chem.* 2, pt. 3: 386-391 (1916). Bibl. footnotes.

ANTISEPTICS

"Antiseptics." *Ind.-Cat. S. G. O.*, 1st ser., 1: 455 (1880); 2nd ser., 1: 546-551 (1896); 3rd ser., 1: 604-606 (1918).

HARVEY, ELLERY H. Bibliography of articles bearing on the bactericidal

action of organic dyes. *Am. J. Pharm.* 96: 588-589 (1924). 32 references.

See also DISINFECTANTS; PHARMACEUTICALS (Soc. Chem. Ind.).

ANTITOXINS

CRAWFORD, ALBERT C., and FOSTER, M. G. The chemistry of diphtheria antitoxin. A review. *Am. J. Pharm.* 90: 765-782 (1918). 134 footnotes.

OPPENHEIMER, CARL. Ueber Antitoxine und ihre Beziehungen zu den Toxinen. *In* Oppenheimer, *Biochem. Handl.* 2: 356-376 (1908). 52 footnotes.

See also ANTIGENS, IMMUNITY.

APATITE. See CALCIUM PHOSPHATE.**APIOL**

ZWALUWENBERG, A. VAN. Bibliography of apiol. *Pharm. Arch.* 2: 23-25 (1899).

APOMORPHINE

"Apomorphia." *Ind.-Cat. S. G. O.*, 1st ser., 1: 489 (1880); 2nd ser., 1: 582-583 (1896); 3rd ser., 1: 685 (1918).

See also ALKALOIDS, MORPHINE.

APOPHYLLIT. See CALCIUM FLUOROHYDROSILICATE.**APOSAFRANINE**

MEYER-JACOBSON. Aposafuranin. *In their Lehrb. org. Chem.* 2, pt. 3: 1402-1405 (1920). Bibl. footnotes.

APPLES

BIGELOW, W. D., GORE, H. C., and HOWARD, B. J. Studies on apples. *U. S. Dept. Agr., Bur. Chem., Bull. No. 94*, 1902. 100 p. Bibl. footnotes.

ARABIN

GRAFE, VIKTOR. Arabin. *In* Abderhalden, *Biochem. Handl.* 2: 2-28 (1911). 225 footnotes. Includes related compounds.

ARABINOSE

HARDING, T. SWANN. Arabinose. *Sugar* 24: 657 (1922). 25 references.

LIPPMANN, E. O. v. *l*-Arabinose. *In his Chemie der Zuckerarten*, 1: 43-105 (1895). Bibl. footnotes.

NEUBERG, CARL, and REWALD, B. Arabinose. *In* Abderhalden, *Biochem. Handl.* 2: 279-289 (1911); 8: 112-114 (1914). About 200 footnotes.

ZEMPLÉN, GÉZA. Arabinose. *In* Abderhalden, *Biochem. Handl.* 10: 378-382 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Arabinose. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 919-923 (1922). Bibl. footnotes.

See also CARBOHYDRATES.

ARAGONITE

LEITMEIER, H. Aragonite. *In* Doelter, *Handb. Mineralchem.* 1: 337-352 (1912). Bibl. footnotes.

See also CALCIUM CARBONATE.

ARGININE

MEYER-JACOBSON. Arginin. *In their* Lehrb. org. Chem. 1, pt. 2: 1424-1427 (1913). Bibl. footnotes.

WINTERSTEIN, ERNST, and TRIER, GEORG. Arginin. *In* Abderhalden, Biochem. Handl. 4: 619-630 (1911); 9: 123 (1915). About 200 footnotes. *See also* AMINO ACIDS; PROTEINS (Plimmer).

ARGON

BRISCOE, H. VINCENT. Argon. *In* Friend, Textbook, 1, pt. 2: 330-345 (1914). Bibl. footnotes.

PARKER, C. LEROY. Partial bibliography of argon. *J. Am. Chem. Soc.* 19: 133-138 (1897). 90 references.

PRANDTL, W. Argon. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 158-166 (1907). References through text.

See also RARE GASES.

ARKANSITE

HAAS, GUSTAV. Arkansit. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 34-35 (1912). References through text.

ARROW-POISON. See POISONS, VENOMS.**ARSANILIC ACID**

BAUM, FRITZ. *p*-Aminophenylarsinsäure, Arsaniisäure. *In* Abderhalden, Biochem. Handl. 1: 226-231 (1911). 60 references.

See also ARSENIC, ORGANIC COMPOUNDS.

ARSENIC

"Arsenic and compounds." Ind.-Cat. S. G. O., 1st ser., 1: 564-579 (1880); 2nd ser., 1: 672-681 (1896); 3rd ser., 2: 2-19 (1920). Includes physiological and therapeutic effects, tests, toxicology and uses.

EPHRAIM, F. Arsen. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 411-642 (1908). References through text.

GT. BRIT. Imperial Mineral Resources Bureau. Mineral Resources of the British Empire and foreign countries. War period. Arsenic. (1913-1919). 1920. 19 p. Bibl., p. 19.

GUTBIER, A., and KRAUTLE, NORA. Ueber kolloides Arsen. *Kolloid-Z.* 20: 186-194 (1917). 24 footnotes.

JONES, CHESTER H. Pure metallic arsenic. *Chem. Met. Eng.* 23: 959-960 (1920). 40 references.

LEBEAU, P. Arsenic. *In* Moissan, Chim. min. 1: 803-855 (1904). 749 footnotes.

MICHEL, H. Gediegen Arsen. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 596-610 (1918). Bibl. footnotes.

SCHENK, —. Arsen. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 553-556 (1907). 150 references.

URBAIN, M. Arsenic. *In* Frémy, Enc. chim. 2, 2^e cahier: 567-568 (1885).

ARSENIC: Analytical.

DE KONINCK, L. L. A propos de la précipitation de l'arsenic par l'acide sulfhydrique. *Bull. soc. chim. Belg.* 23: 88-94 (1909). 42 references.

EPHRAIM, F. Arsen—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 427-430 (1908). Classified.

HOLLAND, E. B. Determination of arsenic in insecticides. *J. Ind. Eng. Chem.* 3: 168-171 (1911). 25 footnotes.

MYERS, CHESTER N. Determination and distribution of arsenic in certain body fluids after the injection of arsenobenzol, salvarsan and neosalvarsan. *Public Health Reports*, 34: 881-889 (1919). Reprint No. 520. 1919. 12 p. Bibl., p. 11-12.

ROARK, R. C., and McDONNELL, C. C. Reduction of As^v to Asⁱⁱⁱ by cuprous chloride and the determination of arsenic by distillation as AsCl₃. *J. Ind. Eng. Chem.* 8: 327-332 (1916). 50 footnotes.

ARSENIC: Organic compounds.

BERTHEIM, A. Handbuch der organischen Arsenverbindungen. Stuttgart, Enke, 1913. 238 p. Bibl. through text.

LEWIS, W. LEE. Recent developments in the organic chemistry of arsenic. *Ind. Eng. Chem.* 15: 17-19 (1923). 38 references.

MANNHEIM, EMIL. Ueber tetraalkylierte Arsoniumbasen. *Ann.* 341: 182-225 (1905). 60 footnotes.

MEYER-JACOBSON. Verbindungen des Arsens. *In their* Lehrb. org. Chem. 1, pt. 1: 433-441 (1907). Bibl. footnotes.

NIERENSTEIN, M. Organische Arsenverbindungen und ihre chemotherapeutische Bedeutung. Sammlung chem. chem.-tech. Vorträge 19: 47-140 (1912). Bibl. footnotes.

RAIZISS, GEORGE W., and GAVRON, JOSEPH L. Organic arsenic compounds. New York, Chem. Catalog Co., 1923. 570 p. Bibl., p. 519-533. 1594 references. Author index, p. 535-536.

See also ANTIMONY, ORGANIC COMPOUNDS; ARSPHENAMINE; ETC.

ARSENIC OXIDES

EPHRAIM, F. Arsen und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 439-463 (1908). References through text.

ARSENIC OXIDES—Cont'd

MICHEL, H. Arsenoxyde. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 610-619 (1918). Bibl. footnotes.

ARSENIC SULFIDES

EPHRAIM, F. Arsen und Schwefel. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 469-480 (1908). References through text.

ARSENIC TRICHLORIDE

EPHRAIM, F. Arsentrichlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 493-500 (1908). References through text.

ARSENICALS

AMPOLA, G., and TOMMASI, G. I composti di arsenico in agricoltura. *Staz. chim.-agar. sperim.*, Ann. Rpt. 5: 241-377 (1911). Bibl. footnotes.

COOK, F. C., and McINDOO, N. E. Chemical, physical and insecticidal properties of arsenicals. U. S. Dept. Agr., Bull. No. 1147 (1923). 58 p. Bibl., p. 55-57. 53 references.

SWINGLE, D. B., MORRIS, H. E., and BURKE, EDMUND. Injury to foliage by arsenical spray mixtures. *J. Agr. Res.* 24: 535-537 (1923). 37 references.

See also INSECTICIDES.

ARSINES

DEHN, WM. M. Primary arsines. *Am. Chem. J.* 33: 101-153 (1905). 150 footnotes.

DEHN, WM. M. Reactions of the arsines. *Am. Chem. J.* 40: 88-127 (1908). Bibl. footnotes.

EPHRAIM, F. Arsen und Wasserstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 431-439 (1908). References through text.

ARSONIC ACIDS

DEHN, WM. M., and McGRATH, S. J. Arsonic and arsinic acids. *J. Am. Chem. Soc.* 28: 347-361 (1906). Bibl. footnotes.

ARSPHENAMINE

ELLIS, ARTHUR W. M. Review of American literature on salvarsan appearing Oct., 1911, to Oct., 1912. *Z. Chemotherap.* 2: 55-61 (1913). 154 references.

EMERY, E. Bibliographie y compris les communications faites en juillet, 1912 aux sociétés savantes et publiées après la rédaction du dernier réferat. *Z. Chemotherap.* 2: 407-414 (1913).

FINZI, C. Arso-derivati e salvarsan. *Giorn. chim. ind. appl.* 2: 49-59 (1920). 40 footnotes.

FORDYCE, JOHN A. Bericht über die amerikanische Salvarsan-literatur. *Z. Chemotherap.* 1: 115-123 (1912). 156 references.

GENNERICH, W. Arbeiten über Salvarsan und Neosalvarsan. *Z. Chemotherap.* 1: 685-686; 2: 37-39; 3: 35-38 (1913-1914).

IVERSEN, JUL. Sammelreferat der russischen Arbeiten über Salvarsan und Neosalvarsan. *Z. Chemotherap.* 1: 169-172; 2: 415-418; 3: 1103-1104 (1912-1914). 189 references.

LEWIS, H. F. A review of the American patent literature on arspenamine (salvarsan) and other arsenicals. *J. Ind. Eng. Chem.* 11: 141-145 (1919). 75 footnotes.

McINTOSH, JAMES. Bericht über die englische Literatur über Salvarsan. *Z. Chemotherap.* 1: 167-168 (1912). 31 references.

MYERS, C. N., and DU METZ, A. G. Qualitative and quantitative tests for arspenamine and neoarsphenamine. *Public Health Reports* 33: 1003-1108 (1918). Reprint No. 472. Bibl., p. 14-16.

"Register der Salvarsan Literatur." *Z. Chemotherap.* 1: 96-125 (1912).

VOEGTLIN, CARL. Arspenamine and related arsenicals. *Physiol. Rev.* 5: 92-94 (1925). 87 references.

See also ARSENIC, ORGANIC COMPOUNDS.

ARTIFICIAL LEATHER. See LEATHER.

ARTIFICIAL PLASTICS. See PLASTICS.

ARTIFICIAL SILK. See CELLULOSE ESTERS, SILK, VISCOSE, ETC.

ARYLHYDROXYLAMINES

BAMBERGER, EUGEN. Arylhydroxylamine und arylazide - eine Parallele. *Ann.* 424: 233-296 (1921). Bibl. footnotes.

ASBESTOS

BOWLES, OLIVER. Asbestos. *Mineral Ind.* 30: 46-54 (1921). 7 references.

CIRKEL, FRITZ. Chrysotile asbestos, its occurrence, exploitation, milling and uses. 2nd ed. Canada, Dept. of Mines, Mines branch, Bull. No. 69, 1910. 316 p. Bibl., p. 290-291. 23 titles. 1st ed. issued in 1905.

DOELTER, C. Asbest. *In his* Handb. Mineralchem. 2, pt. 1: 603-610 (1914). Bibl. footnotes.

DILLER, J. S. The types, mode of occurrence and important deposits of asbestos in the United States. U. S. Geol. Sur., Bull. No. 470, 1911. Bibl., p. 523-524. 17 references.

GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Asbestos. (1913-1919). 1921. 34 p. Bibl., p. 34.

HALL, ARTHUR L. Asbestos in the Union of South Africa. Union of South Africa, Geol. Sur., Mem. 12,

1918. 152 p. Bibl., p. 141-142. 46 titles.
- MEYER, H. H. B. Brief list of references on the asbestos industry. Mimeographed. U. S. Library of Congress, 1920. 68 references.
- ASPARAGIN**
- "Asparagin." Ind.-Cat. S. G. O., 2nd ser., 1: 721 (1896); 3rd ser., 2: 91-92 (1920).
- MEYER-JACOBSON. Asparagin. *In their* Lehrb. org. Chem. 1, pt. 2: 780-782 (1913). Bibl. footnotes.
- PRINGSHEIM, HANS. Asparagin. *In* Abderhalden, Biochem. Handl. 4: 597-606 (1911); 9: 113-115 (1915). About 200 footnotes.
- ASPARAGINIC ACID**
- MEYER-JACOBSON. Asparaginsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 778-779 (1913). Bibl. footnotes.
- PRINGSHEIM, HANS. Asparaginsäure. *In* Abderhalden, Biochem. Handl. 4: 587-597 (1911); 9: 110-113 (1915). About 200 footnotes.
- See also* AMINO ACIDS.
- ASPHALT**
- ABRAHAM, HERBERT. Asphalts and allied substances, their occurrence, mode of production, uses in the arts and methods of testing. 2nd ed. New York, Van Nostrand, 1920. 608 p. Bibl. footnotes. p. 583-586, list of books, 1841-1920.
- DAY, DAVID T. Asphalt. U. S. Geological Survey publications. U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 543-544; 1914, pt. 2: 362. 24 entries.
- FISCHER, J. Die künstlichen Peche und Asphalte. *Kunststoffe* 1: 447-452, 471-474 (1911). Patents.
- FISCHER, EMIL J. Technische Asphalt- und Pechpräparate. *Kunststoffe* 10: 31-32, 39-43 (1920). 112 patents. Reprinted in MARCUSSON, J., Die natürlichen und künstlichen Asphalte. Leipzig, Engelmann, 1921. 262 p.
- MARKFELDT, O. [Asphalt and tar industries in 1913-1914.] *Asph. Teer-ind. Ztg.* 15: 265, 282, 297, 316, 345, 363, 379, 394, 409, 427, 442, 473, 489, 538 (1915); 16: 7, 65, 82 (1916). About 200 footnotes.
- SCHMIDT, CARL. Asphalt. Steinsalz, Erze. Berlin, Spring, 1907. Reprinted from *Handwörterbuch der Schweizer. Volkswirtschaft Sozialpolitik und Verwaltung*, 3, p. 91-92, 103-107, 112-154. Bibl. at end of each article.
- SWOBODA, JULIUS. Der Asphalt und seine Verwendung. Hamburg, 1904. Patents, p. 157-162.
- See also* BITUMENS, PETROLEUM (Redwood).
- ASPIDUM.** *See* OLEORESINS.
- ASPIRIN**
- "Aspirin." Ind.-Cat. S. G. O., 3rd ser., 2: 98-99 (1920).
- ASSAYING**
- SMITH, ERNEST A. Early methods of assaying. *Bull. Inst. Mining Eng.*, 1924, No. 232: 1-57.
- ATMOSPHERE**
- FRIEND, J. N., and TWISS, DOUGLAS F. The atmosphere. *In* Friend, Textbook 7, pt. 1: 156-204 (1924). Bibl. footnotes.
- LUCAS, RICHARD. Die radioaktiven Erscheinungen der Atmosphäre. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 46-48 (1908). References through text.
- See also* AIR, OXYGEN, etc.
- ATOMIC STRUCTURE**
- ANDRADE, EDWARD N. DA C. The structure of the atom. London, Bell, 1923. 314 p. Bibl. at end of chapters.
- AUWERS, O. v. Magnetismus und Atombau. *Jahrb. Radioakt. Elektronik* 17: 181-186 (1921). 223 references.
- BORN, MAX. Das Atom. *Naturwissenschaften* 8: 226 (1920). 33 references.
- BRUNETTI, RILA. Il nucleo atomico. *Nuovo Cimento* 22: 242-245 (1921). 70 references.
- CLAY, J. [The structure of the atom.] *Chem. Weekblad* 13: 1078-1103 (1916).
- DEBYE, P. Laue-Interferenzen und Atombau. *Naturwissenschaften* 10: 390-391 (1922). 51 references.
- FAJANS, K. [The periodic system of the elements, the radioactive transformations and the structure of the atom.] *Physik. Z.* 16: 456-486 (1915).
- HARKINS, W. D., and WILSON, E. D. Recent work on the structure of the atom. *J. Am. Chem. Soc.* 37: 1420-1421 (1915). 60 references.
- LEPAPE, ADOLPHE. La discontinuité et l'unité de la matière. *Bull. soc. chim.* 31: 1-94 (1922). Bibl. footnotes.
- McLENNAN, J. C. Atomic nuclei. *Science* 55: 219-232 (1922); *Radium* (N. S.) 1: 333-347 (1923). 35 footnotes.
- MELLOR, J. W. The architecture of the atom. *In his* Inorg. theor. chem. 4: 155-203 (1923). Bibl. through chapter.
- SMITH, JOHN D. M. Chemistry and atomic structure. London, Benn, 1924. 221 p. Bibl., p. 207-209.
- STOCK, ALFRED. Structure of atoms. New York, Dutton, 1923. 88 p.
- See also* ELECTRONICS, VALENCE.

ATOMIC THEORY

MELDRUM, A. N. The development of the atomic theory. *Proc. Manchester Lit. Phil. Soc.* 54, 7: 1-16 (1909); 55, 3: 1-12; 4: 1-15; 5: 1-22; 6: 1-18; 19: 1-10; 22: 1-11 (1911-1912). Bibl. footnotes.

ATOMIC VOLUME

MELLOR, J. W. Atomic, molecular and specific volumes. *In his Inorg. theor. chem.* 1: 228-247 (1922). 100 references.

TRAUBE, J. Ueber Volumtheorie. *Jahrb. Radioak. Elektronik* 3: 168-184 (1906). Bibl. footnotes.

ATOMIC WEIGHTS

BECKER, GEORGE F. Atomic weight determinations, a digest of the investigations published since 1814. *Smithsonian Misc. Coll. No.* 358. Washington, 1880. 149 p. Classified by elements.

BRAUNER, B. Atomgewicht. *In Abegg, Handb. anorg. Chem.*, under each element.

CLARKE, FRANK C. Constants of nature. V. Recalculation of atomic weights. 4th ed., *Mem. Nat. Acad. Sci.*, No. 16, 3rd memoir, 1920. 418 p. Bibl. footnotes.

FRIEND, J. N. Atomic weights. *In his Textbook*, 1, pt. 1: 229-264 (1914). Bibl. footnotes.

GMELIN-KRAUT. Atomgewicht. *In their Handb. anorg. Chem.*, under the name of each element.

HINRICHSSEN, F. W., and KINDSCHER, E. Atomgewichtsforschung. *Fortschritte Chem.* 1: 355-359 (1909); 3: 199-206 (1910-1911). References through text.

KINDSCHER, E. Atomgewichtsforschung. *Fortschritte Chem.* 5: 1-8 (1912); 7: 41-51 (1913); 9: 1-4 (1914); 10: 261-270 (1914-1915); 11: 243-256 (1915-1916); 13: 97-105 (1917-1918); 14: 65-77 (1918-1919). References through text.

KÖTHNER, F., and TIEDE, R. Atomgewichtsforschung. *Fortschritte Chem.* 1: 1-7 (1909). References through text.

LANDOLT-BÖRNSTEIN. Atomgewichtsbestimmung. *In their Tabellen*, 5th ed., 2-11 (1923).

RICHARDS, T. W. Account of the researches on atomic weights at Harvard University. *J. chim. phys.* 6: 131-136 (1908). 62 references.

RICHARDS, THEODORE W. Atomic weights and isotopes. *Chem. Rev.* 1: 37-40 (1924). 51 references.

See also Annual report of the International Committee on Atomic Weights, published annually in the various chemical journals.

ATOPHAN

"Atophan." *Ind.-Cat. S. G. O.*, 3rd ser., 2: 169-170 (1920).

ATOXYL

"Atoxyl." *Ind.-Cat. S. G. O.*, 3rd ser., 2: 170-171 (1920).

See also ARSENIC, ORGANIC COMPOUNDS.

ATROPINE

"Atropine, physiological action of." *Ind.-Cat. S. G. O.*, 1st ser., 1: 676-678 (1880); 2nd ser., 1: 778-780 (1896); 3rd ser., 2: 186-188 (1920). Includes toxicology.

SCHMIDT, JULIUS. Atropin. *In Abderhalden, Biochem. Handl.* 5: 78-83 (1911). 35 footnotes.

See also ALKALOIDS.

AUGITE. *See* CALCIUM SILICATES.**AURAMINE**

SEMPER, LEOPOLD. Die Konstitution des Auramins. *Ann.* 381: 234-264 (1911). Bibl. footnotes.

AUTOINTOXICATION

ALVAREZ, WALTER C. Intestinal auto-intoxication. *Physiol. Rev.* 4: 383-393 (1924). Contains references to bibls. on particular phases of the problem.

AUTOLYSIS

"Autolysis." *Ind.-Cat. S. G. O.*, 3rd ser., 2: 221-223 (1920).

BRADLEY, H. C. Autolysis and atrophy. *Physiol. Rev.* 2: 415-439 (1922). 156 references.

DERNBY, KARL G. Study of autolysis of animal tissues. *J. Biol. Chem.* 35: 179 (1918). 45 references.

FÜRTH, OTTO v. Autolysis. *In his Chemistry of metabolism*, 1916, p. 75-96. 55 footnotes. References to earlier bibl.

WELLS, H. G. Autolysis. *In his Chemical pathology*, 4th ed., 1920, p. 76-100. 90 footnotes.

ZUNZ, EDGARD. Autolytische Fermente. *In Abderhalden, Biochem. Handl.* 5: 604-608 (1911). 90 footnotes.

AUTOMOBILE TIRES. *See* TIRES.**AUTOOXIDATION**

ENGLER, C., and WEISBERG, —. Kritische Studien über die Vorgänge der Autoxydation. Braunschweig, Vieweg, 1904. 204 p. Bibl. footnotes.

ENGLER, C., and WÖHLER, L. Pseudokatalytische Sauerstoffübertragung. *Z. anorg. Chem.* 29: 1-21 (1902). 60 footnotes.

MEYER, JULIUS. Zur Theorie der Autoxydation. *J. prakt. Chem.* 180: 278-296 (1905). Bibl. footnotes.

PRANDTL, W. Autoxydation und Aktivierung des Sauerstoffs. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 26-28 (1907). References through text.

TRAUBE, MORITZ. Zur Lehre von der Autoxydation. Ber. 22: 1496-1514, 3057-3062 (1889). 60 footnotes.

AUXOCHROMES

KAUFFMANN, HUGO. Die Auxochrome. Sammlung chem. chem.-tech. Vorträge 12: 1-112 (1907). Bibl. footnotes.

AVOGADRO'S THEORY

GRAEBE, C. Der Entwicklungsgang der Avogadroschen Theorie. J. prakt. Chem. 195: 145-208 (1913). Bibl. footnotes.

See also HISTORY.

AZELAIC ACID

MEYER-JACOBSON. Azelainsäure. In *their* Lehrb. org. Chem. 1, pt. 2: 404 (1913). 40 references.

THIELE, ALBRECHT. Azelainsäure. In Abderhalden, Biochem. Handl. 1: 1140-1142 (1911). Bibl. footnotes.

AZO BENZENE

MEYER-JACOBSON. Azobenzol. In *their* Lehrb. org. Chem. 2, pt. 1: 255 (1895).

AZOXY COMPOUNDS

ANGELI, ANGELO. Ueber die Konstitution der Azoxyverbindungen. Sammlung chem. chem.-tech. Vorträge 19: 447-478 (1913). Bibl. footnotes.

AZURITE. See COPPER CARBONATE.

BACTERIA

"Bacteria." Ind.-Cat. S. G. O., 2nd ser., 2: 15-19 (1897); 3rd ser., 2: 272-273, 279-281 (1920). Chemistry and chemical products of bacteria. Effects of physical and chemical agents.

CLARK, W. M., and LUBS, H. A. Improved chemical methods for differentiating bacteria of the Coli-aerogenes family. J. Biol. Chem. 30: 209-234 (1917). 44 references.

FALK, I. S. Rôle of certain ions in bacterial physiology. Abstr. Bact. 7: 133-147 (1923).

FOWLER, GILBERT J. An introduction to bacteriological and enzyme chemistry. London, Arnold, 1911. 328 p. Bibl., p. 312-317.

KENDALL, ARTHUR I. Bacterial metabolism. Physiol. Rev. 3: 438-445 (1923). 23 references.

KENDALL, ARTHUR I. Bacterial metabolism, normal and abnormal, within the body. In Barker, Endocrinology and metabolism 3: 663-715; references, 5: 345-509 (1922).

LEACH, MARY F. Chemistry of *Bacillus coli communis*. J. Biol. Chem. 1: 493-502 (1906). 200 references.

DE SCHWEINITZ, EMIL A., and DORSET, M. Chemical examination of various tubercle bacilli. U. S. Dept.

Agr., Bur. Animal Ind., Cir. No. 52, p. 99-105. Bibl., p. 104-105.

WELLS, H. G. Chemistry of bacteria and their products. In *his* Chemical pathology, 4th ed., p. 101-127 (1920). 167 footnotes.

WHEELER, SYBIL M. Chemistry of bacterial cellular proteins. J. Biol. Chem. 6: 550-552 (1909). 50 references.

BACTERIAL PIGMENTS

SULLIVAN, M. V. Synthetic culture media and the biochemistry of bacterial pigments. J. Med. Res. 14: 153-160 (1905). Chronological.

BAKING POWDER

"Baking powders." Ind.-Cat. S. G. O., 2nd ser., 2: 63 (1897); 3rd ser., 2: 323 (1920).

See also ALUM.

BAKELITE. See PLASTICS, ARTIFICIAL.

BALSAMS

"Balsams." Ind.-Cat. S. G. O., 1st ser., 1: 748 (1880); 2nd ser., 2: 79 (1897); 3rd ser., 2: 332-333 (1920).

DIETERICH, K. Analysis of resins, balsams and gum resins. 2nd ed. London, 1920. 431 p. "Bibl. of all balsams, resins, and gum resins."

BANANAS

GORE, H. C. Changes in composition of peel and pulp of ripening bananas. J. Agr. Res. 3: 187-203 (1914). 22 references.

BARBITURIC ACID

MEYER-JACOBSON. Barbitursäure. In *their* Lehrb. org. Chem. 2, pt. 3: 1194-1199 (1920). Bibl. footnotes.

See also PYRIMIDINES.

BARIUM

"Barium." Ind.-Cat. S. G. O., 1st ser., 1: 767 (1880); 2nd ser., 2: 101-102 (1897); 3rd ser., 2: 348-349 (1920).

COPAUX, H. Baryum. In Moissan, Chim. min. 3: 623-683 (1904). 438 footnotes.

EPHRAIM, FRITZ. Baryum. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 1-124 (1909). References through text.

GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Barium metals. (1913-1919). 1921. 26 p. Bibl., p. 24-26.

SACKUR, OTTO. Barium. In Abegg, Handb. anorg. Chem. 2, pt. 2: 290-298 (1905). 416 references.

See also ALKALINE EARTHS (Mellor).

BARIUM ARSENATE

EPHRAIM, F. Baryumarsenate. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 551-554 (1908). References through text.

BARIUM CARBONATE

EPHRAIM, FRITZ. Baryumcarbonat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 101-107 (1909). References through text.

LEITMEIR, H. Bariumcarbonat. In Doelter, Handb. Mineralchem. 1: 490-501 (1912). Bibl. footnotes.

See also ALKALINE EARTHS (Mellor).

BARIUM CARBONATE: Toxicity.

SCHWARTZE, E. W. Toxicity of barium carbonate to rats. U. S. Dept. Agr., Bull. No. 915. 1920. 11 p. Bibl., p. 10-11. 20 references.

BARIUM CHLORIDE

EPHRAIM, FRITZ. Baryumchlorid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 58-65 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

BARIUM HYDROXIDE

EPHRAIM, FRITZ. Baryumhydroxid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 16-20 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

BARIUM NITRATE

EPHRAIM, FRITZ. Baryumnitrat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 30-33 (1909). References through text.

KAILAN, A. Bariumnitrat. In Doelter, Handb. Mineralchem. 3, pt. 1: 293-297 (1918). Bibl. footnotes.

See also ALKALINE EARTHS (Mellor).

BARIUM OXIDE

BRÄUER, A. Bariumoxyd. In Bräuer and d'Ans, Fortschritte, 1: 1516 (1921). German patents.

EPHRAIM, FRITZ. Baryumoxid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 15-16 (1909).

See also ALKALINE EARTHS (Mellor).

BARIUM PEROXIDE

EPHRAIM, FRITZ. Baryumdioxid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 20-25 (1909). References through text.

BARIUM PHOSPHATES

EPHRAIM, FRITZ. Baryum hypo-, ortho-, meta- und pyrophosphate. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 83-92 (1909).

See also ALKALINE EARTHS (Mellor).

BARIUM SULFATE

EPHRAIM, FRITZ. Baryumsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 39-47 (1909). References through text.

HORN, D. W. Barium sulfate in gravimetric analysis. Am. Chem. J. 27: 495-500 (1902). 100 footnotes.

WEISER, HARRY B. Effect of adsorption on the physical character of precipitated barium sulfate. J. Phys.

Chem. 21: 314-333 (1917). 29 footnotes.

See also ALKALINE EARTHS (Mellor), BARYTES.

BARIUM SULFIDE

EPHRAIM, FRITZ. Baryumsulfid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 33-39 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

BARYTES

ALLEN, M. M., and BUTLER, G. M. Barytes. Univ. Arizona, Bull. No. 99 (Min. tech. series, Bull. No. 22), 1919. 18 p. 22 references.

HILL, JAMES M. Barytes. U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 172-173; 1914, pt. 2: 65. About 40 references to "important articles of recent date."

PHALEN, W. C. Barytes. U. S. Geol. Sur., Mineral Resources, 1911, pt. 2: 969-970. 19 titles, 1904-1911.

TARR, W. A. The barite deposits of Missouri and the geology of the barite district. Univ. Mo., Studies, 3, No. 1, 1918. 111 p. Bibl., p. 106-111. 88 references.

WATSON, THOMAS L., and GRASTY, J. S. Barite of the Appalachian States. Trans. Am. Inst. Mining Eng. 51: 557-559 (1915); Chem. Eng. 21: 142-143 (1915). 37 references.

See also BARIUM SULFATE.

BASES: Organic.

BARGER, GEORGE. The simpler natural bases. New York, Longmans, 1914. 215 p. Bibl., p. 167-211.

DALMER, OTTO. Stickstoffbasen (Tierische Alkaloide). In Oppenheimer, Handb. Biochem., 2nd ed., 1: 198-212 (1924). 80 footnotes.

See also names of individual organic bases, AMINES, AMINO ACIDS, BETAINES, ETC.

BAUDOUIN TEST

FLEIG, C. [Review and bibliography of Baudouin, Villaveccia and Fabris test.] Ann. chim. anal. appl. 14: 132-138 (1920).

BAUXITE

BRANNER, J. C. Bibliography of bauxite. J. Geol. 5: 285-289 (1897). 93 references.

DITTLER, E., and DOELTER, C. Bauxite, ein natürliches Tonerdhydrogel. Kolloid-Z. 9: 282-290 (1911). 28 footnotes.

PHALEN, W. C. Bauxite and aluminum. U. S. Geol. Sur., Mineral Resources, 1914, pt. 1: 208-209. 46 references, 1892-1911.

WATSON, O. L. Preliminary report on the bauxite deposits of Georgia. Georgia Geol. Sur., Bull. No. 11, 1904. 169 p. Bibl., p. 159-164. 82 references.

BAYER 205

FOURNEAU, E., *et al.* [Chemotherapeutic researches in the series "Bayer 205."]. Ann. Inst. Pasteur 38: 81-114 (1924).

BEATING. *See* PULP, BEATING.

BECKMANN REARRANGEMENT

JONES, LAUDER W. Beckmann rearrangement of hydroxamic acids. Am. Chem. J. 48: 1-26 (1912). Bibl. footnotes.

STIEGLITZ, JULIUS. Beckmann rearrangement. Am. Chem. J. 29: 49-68 (1903). 56 footnotes.

BEER

"Beer." Ind.-Cat. S. G. O., 1st ser., 1: 838-840 (1880); 2nd ser., 2: 191-193 (1897); 3rd ser., 2: 418-419 (1920).

See also BEVERAGES, BREWING, FOODS (Vereinbarungen).

BEES-WAX

WILEY, H. W. Bees-wax and waxes used in adulterating bees-wax. U. S. Dept. Agr., Bur. Chem., Bull. No. 13, pt. 6: 866-871 (1892). Chronological, 1848-1891.

BEETS: Analysis.

BRYAN, A. HUGH. Bibliography of chemical literature on methods of analyzing beets, 1839-1906. In U. S. Dept. Agr., Bur. Chem., Bull. No. 146, p. 40-48 (1911).

BELLADONNA

"Belladonna." Ind.-Cat. S. G. O., 1st ser., 1: 855-859 (1880); 2nd ser., 2: 213-214 (1897); 3rd ser., 2: 432-433 (1920).

RIPERT, JEAN. Sur la variation et le rôle des alcaloïdes de la belladone. Rennes, Impr. Oberthür, 1922. 152 p. Bibl. at end of chapters.

See also ALKALOIDS.

BENCE JONES PROTEIN

ROSENBLOOM, JACOB. A contribution to the study of the nature and origin of the Bence Jones protein. Thesis, Columbia Univ., 1909. 64 p. Bibl., p. 49-64.

ROSENBLOOM, JACOB. Review of the history of Bence Jones protein and multiple myeloma. Biochem. Bull. 1: 161-173 (1911). 87 references.

ROSENBLOOM, JACOB. Bence-Jones protein. In Barker, Endocrinology and metabolism, 4: 485-500; references, 5: 511-694 (1922).

BENTONITE

SPENCE, HUGH S. Bentonite. Canada, Dept. Mines, Mines Br., 1924. 35 p. Bibl., p. 32-35.

BENZALDEHYDE

MEYER-JACOBSON. Benzaldehyd. In *their* Lehrb. org. Chem. 2, pt. 1: 484 (1902). Bibl. footnotes.

WITTE, E. Benzaldehyd. In Abderhalden, Biochem. Handl. 1: 808-812 (1911). 130 footnotes.

BENZALDOXIME

MEYER-JACOBSON. Benzaldoxime. In *their* Lehrb. org. Chem. 2, pt. 1: 511 (1902). Bibl. footnotes.

BENZENE

BAUM, FRITZ. Benzol. In Abderhalden, Biochem. Handl. 1: 157-175 (1911). About 350 footnotes.

"Benzene." Ind.-Cat. S. G. O., 1st ser., 1: 873 (1880); 2nd ser., 2: 235-236 (1897); 3rd ser., 2: 447-448 (1920). Includes toxicology.

LIFSCHITZ, J. Alte und neue Benzolformeln. Z. angew. Chem. 24: 1153-1161 (1911). 51 footnotes.

MARCKWALD, WILLY. Die Benzoltheorie. Sammlung chem. chem.-tech. Vorträge 2: 1-34 (1898). Bibl. footnotes.

MEYER-JACOBSON. Der aromatische Charakter und die Constitution der Benzols. In *their* Lehrb. org. Chem. 2, pt. 1: 41-113 (1895). Bibl. footnotes.

SCHWALBE, CARL. Benzoltabellen. Darstellungsmethoden und Eigenschaften der einfacheren, technisch wichtigen Benzolderivaten und der Literatur zusammengestellt. Berlin, Borntraeger, 1903. 266 p. Compounds arranged by groups with references.

See also GASOLINE (Howard); HYDROCARBONS.

BENZENE: Motor fuel.

ELLIS, C., and MEIGS, J. V. Benzol as a motor fuel. In *their* Gasoline and other motor fuels, 1921, p. 541-543. 50 references.

BENZENECARBOXYLIC ACIDS

TREIBS, WILHELM. Ueber die Eigenschaften der Benzolkarbonsäuren. Ges. Abhandlungen zur Kenntniss der Kohle 5: 577-619 (1922). Bibl. footnotes.

BENZENESULFINIC ACIDS

MEYER-JACOBSON. Benzolsulfinsäure. In *their* Lehrb. org. Chem. 2, pt. 1: 141 (1895).

BENZENESULFONIC ACIDS

MEYER-JACOBSON. Benzolsulfosäuren. In *their* Lehrb. org. Chem. 2, pt. 1: 130-139 (1895). Bibl. footnotes.

BENZIMIDAZOLE

MEYER-JACOBSON. Benzimidazolgruppe. In *their* Lehrb. org. Chem. 2, pt. 3: 485-495 (1916). Bibl. footnotes.

BENZINE

"Benzine." Ind.-Cat. S. G. O., 2nd ser., 2: 235 (1897); 3rd ser., 2: 446-447 (1920). Toxicology.

See also GASOLINE, PETROLEUM.

BENZOACRIDINES

MEYER-JACOBSON. Benzoacridin. *In their* Lehrb. org. Chem. 2, pt. 3: 1120-1121 (1918). Bibl. footnotes.

BENZOIC ACID

"Benzoic acid." Ind.-Cat. S. G. O., 1st ser., 1: 75 (1880); 2nd ser., 1: 101-102 (1896); 3rd ser., 1: 107-108 (1918).

DOHRN, M., and THIELE, A. Benzoesäure. *In* Abderhalden, Biochem. Handl. 1: 1185-1211 (1911). About 500 footnotes, covering the acid and its derivatives.

McKEE, RALPH H., and STRAUSS, FRANK A. Synthesis of chlorine-free benzoic acid from benzene. Chem. Met. Eng. 24: 638-644 (1921). 71 footnotes. See also STRAUSS, Thesis, Columbia Univ., 1920, 40 p. "Bibl. of the formate method of synthesizing aromatic acids," p. 38-39.

MEYER-JACOBSON. Benzoessäure. *In their* Lehrb. org. Chem. 2, pt. 1: 536-542 (1896). Bibl. footnotes.

BENZOIC ACID: Physiological.

GERLACH, V. Physiologische Wirkung der Benzoessäure und des benzoessäuren Natronn. Wiesbaden, 1909. 95 p.

"Influence of sodium benzoate on the nutrition and health of man." *In* U. S. Dept. Agr., Rept. No. 88, p. 771-784 (1909). Annotated.

LEHMANN, K. B. Die Benzoessäure. Der gegenwärtige Stand unseres Wissen ueber die Wirkung und hygienische Zulässigkeit dieses Konservierungsmittels. Chem.-Ztg. 32: 949-952 (1908). 37 footnotes.

LEHMANN, K. B. Die neuesten Arbeiten ueber Bestimmung, Konservierungskraft und Zulässigkeit der Benzoessäure (1908-1911). Chem.-Ztg. 35: 1297-1299, 1314-1317 (1911). 80 footnotes.

ROST, E., FRANZ, F., and WEITZEL, A. [The study of the effects of benzoic acid and its sodium salt upon the animal organism.] Arb. kais. Gesundh. 45: 425-490 (1913).

BENZOPYRANE COMPOUNDS

MEYER-JACOBSON. Benzopyran-Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 724-752 (1917). Bibl. footnotes.

BENZOPYRONE. See CHROMONES.**BENZOQUINONE.** See QUINONE.**BENZOTHIAZOL**

MEYER-JACOBSON. Benzothiazol-Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 549-558 (1916). Bibl. footnotes.

BENZOYLACETIC ACID

MEYER-JACOBSON. Benzoylessigsäure. *In their* Lehrb. org. Chem. 2, pt. 1: 725 (1902).

BENZOYL CHLORIDE

MEYER-JACOBSON. Benzoylchlorid. *In their* Lehrb. org. Chem. 2, pt. 1: 545-548 (1902). Bibl. footnotes.

BENZYL ALCOHOL

MEYER-JACOBSON. Benzylalkohol. *In their* Lehrb. org. Chem. 2, pt. 1: 466-467 (1896). Bibl. footnotes.

PINCUSOHN, L. Benzylalkohol. *In* Abderhalden, Biochem. Handl. 1: 705-719 (1911). 200 footnotes. Includes derivatives.

BENZYLAMINE

MEYER-JACOBSON. Benzylamine. *In their* Lehrb. org. Chem. 2, pt. 1: 241-243 (1895). Bibl. footnotes.

BERBERINE

RUPE, H., and ALTENBURG, H. Berberin. *In* Abderhalden, Biochem. Handl. 6: 132-140 (1911). 40 footnotes.

See also ALKALOIDS.

BERI-BERI. See VITAMINS.**BERYLLIUM**

CLEVE, P. T. Le glucinium et ses composés. *In* Frémy, Enc. Chim. 3, 5^e cahier: 23-25 (1884).

DAWSON, H. M. Beryllium. *In* Abegg, Handb. anorg. Chem. 2, pt. 2: 24-25 (1905). 57 references, 1798-1904.

ENGLE, E. A., and HOPKINS, B. S. The metallurgy and alloys of beryllium. Trans. Am. Electrochem. Soc. 45: 255-262 (1924). 23 footnotes.

EPHRAIM, FRITZ. Beryllium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 515-555 (1909). References through text.

LEBEAU, P. Glucinium. *In* Moissan, Chim. min. 3: 886-905 (1904). 220 footnotes.

MELLOR, J. W. Beryllium or glucinium. *In his* Inorg. theor. chem. 4: 204-248 (1923). References through chapter.

NEGRU, J. S. Glucinium. Chem. Met. Eng. 21: 353-359 (1919). 33 references.

PARSONS, C. L. Chemistry and literature of beryllium. Easton, Chem. Pub. Co., 1909. 180 p. Bibl., p. 72-168.

BERYLLIUM SILICATES

DOELTER, C. Beryllium-Aluminiumsilicate. *In his* Handb. Mineralchem. 2,

pt. 2: 583-602 (1917). Bibl. footnotes.

DOELTER, C. Berylliumsilicate. *In his* Handb. Mineralchem. 2, pt. 1: 276-288 (1914). Bibl. footnotes.

BERYLLIUM SULFATE

KRAUSS, F., and GERLACH, H. Zur Kenntniss des Berylliumsulfates und seiner Hydrate. *Z. anorg. allgem. Chem.* 140: 79-80 (1924). 41 references.

BETAINÉ

MEYER-JACOBSON. Betain. *In their* Lehrb. org. Chem. 1, pt. 2: 751-752 (1913). Bibl. footnotes.

See also AMINES, BASES, CHOLINE.

BEVERAGES

"Alcoholic drinks." *Ind.-Cat. S. G. O.*, 2nd ser., 1: 223-230 (1896).

"Beverages." *Ind.-Cat. S. G. O.*, 2nd ser., 2: 286 (1897); 3rd ser., 2: 493-494 (1920).

NOWAK, CARL A. New fields for brewers and others active in the fermentation and allied industries. St. Louis, Nowak, 1917. Bibl. of related literature, p. 269-300.

NOWAK, CARL A. Non-intoxicants, a practical manual on the manufacture of soft drink extracts and cereal beverages. St. Louis, Nowak, 1922. 295 p. Bibl. of related literature, p. 277-295.

See also BEER, COFFEE, COCOA, DISTILLED LIQUORS, TEA, WINES, ETC.

BILE

"Bile." *Ind.-Cat. S. G. O.*, 1st ser., 2: 48-52 (1881); 2nd ser., 2: 318-322 (1897); 3rd ser., 2: 511-518 (1920). Includes bile acids, antiseptic and bactericidal power, chemistry, pigments, salts, secretion and elimination, therapeutic use.

"Bile and its constituents in therapy." *In* Merck's Annual Reports 28: 1-74 (1914). Bibl. footnotes.

HAMMERSTEN, OLOF. Zur Chemie der Galle. *Ergeb. Physiol.* 4: 1-2 (1905). 42 references.

WHIPPLE, G. H. The origin and significance of the constituents of the bile. *Physiol. Rev.* 2: 440-459 (1922). 66 references.

WOHLGEMUTH, JULIUS. Leber und Galle. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 150-223 (1910). Liver, 315 footnotes. Bile, 100 footnotes.

BILE ACIDS

BORSCHÉ, W. Methoden der Abbau- und Aufbaustudien auf dem Gebiete der Gallensäuren. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 6: 249-284 (1922). Bibl. footnotes.

FOSTER, M. G., and HOOPER, C. W. Quantitative method for analysis of bile acids in dog's bile. *J. Biol. Chem.* 38: 355 (1919). 24 references.

HAMMERSTEN, OLOF. Darstellung der Gallensäuren und ihrer wichtigsten Abbauprodukte und ihr Nachweis. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 6: 211-248 (1922). Bibl. footnotes.

KLANHARDT, F. Die Gallensäuren. *In* Abderhalden, Biochem. Handl. 10: 182-212 (1923). Bibl. footnotes.

KNOOP, FRANZ, and FODOR, A. Die Gallensäuren. *In* Abderhalden, Biochem. Handl. 3: 310-330 (1911); 8: 494-500 (1914). About 165 references.

MEYER-JACOBSON. Gallensäuren. *In their* Lehrb. org. Chem. 2, pt. 4: 233-261 (1924). Bibl. footnotes.

BILE PIGMENTS

BORRIEN, VICTOR. Contribution à l'étude chimique des pigments biliaries en coprologie. Univ. Paris, École supérieure de pharmacie, 1910-1911, Pub. No. 8. 83 p. Bibl., p. 81-83.

KÜSTER, WM. Über den Chemismus der Bildung des Gallenfarbstoffs aus der eisenhaltigen Komponente des Blutfarbstoffs. *Arch. Pharm.* 253: 494-497 (1915). 90 references.

KÜSTER, WM. Gallenfarbstoffe. *In* Abderhalden, Biochem. Handl. 10: 33-38 (1923). Bibl. footnotes.

MÜLLER, FRANZ. Die Gallenfarbstoffe. *In* Oppenheimer, Handb. Biochem. 1: 730-735 (1909). 18 footnotes.

REINHOLD, B. v. Gallenfarbstoffe. *In* Abderhalden, Biochem. Handl. 6: 277-292 (1911); 9: 388-399 (1915). Bibl. footnotes.

See also BILIRUBIN, BLOOD PIGMENTS.

BILIRUBIN

"Bilirubin." *Ind.-Cat. S. G. O.*, 3rd ser., 2: 535 (1920).

REINHOLD, B. v. Bilirubin. *In* Abderhalden, Biochem. Handl. 6: 277-284 (1911); 9: 388-391 (1915). 115 footnotes.

BINARY SYSTEMS

AUWERS, O. v. Magnetismus und Atombau. *Jahrb. Radioakt. Elektronik.* 17: 181-229 (1921). p. 216-223 lists binary systems with references.

KREMANN, R. Die Eigenschaften der binären Flüssigkeitsgemische, ein Beitrag zur Theorie der konzentrierten Systeme. *Sammlung chem. chem.-tech. Vorträge* 23: 1-266 (1916). Bibl. footnotes.

KUENEN, J. P. Theorie der Verdampfung und Verflüssigung von Gemischen und der fraktionierten Des-

BINARY SYSTEMS—Cont'd

tillation. Leipzig, Barth, 1906. 244 p. Binary mixtures, p. 48, 181. Critical phenomena, p. 94, 183. Vapor pressure, p. 133-134. Volume change, p. 142-143.

MENSHUTKIN, B. N. [Binary systems having at least one organic component which have been studied by the method of thermal analysis.] *J. chim. phys.* 9: 641-652 (1911); 11: 674-702 (1913).

BIOCHEMISTRY: General.

ABDERHALDEN, EMIL. *Biochemisches Handlexikon*. 10 vol. Berlin, Springer, 1909-1923. Covers the chemistry of all organic compounds of interest to the biochemist and contains thousands of references.

ABDERHALDEN, EMIL. *Handbuch der biochemischen Arbeitsmethoden*. 9 vol. Berlin, Urban, 1910-1919. Contains many references to the methods used in biochemical research.

ABDERHALDEN, EMIL. *Handbuch der biologischen Arbeitsmethoden*. Berlin, Urban, 1920+. A comprehensive work, covering experimental methods in all biological sciences, including biochemistry. *Bibl. footnotes*.

HÖBER, RUDOLF. *Physikalische Chemie der Zelle und der Gewebe*. 5th ed. Leipzig, Engelmann, 1923. *Bibl. footnotes*.

MCCLENDON, J. F. *Physical chemistry of vital phenomena for students and investigators in the biological and medical sciences*. Princeton, Princeton Univ. Press, 1917. 240 p. *Bibl.*, p. 198-233.

OPPENHEIMER, CARL. *Handbuch der Biochemie des Menschen und der Tiere*. 5 vol. Jena, Fischer, 1909-1913. 2nd ed., 1923+. *Bibl. footnotes*.

ROBERTSON, THORBURN B. *Principles of biochemistry, for students of medicine, agriculture and related sciences*. 2nd ed. Philadelphia, Lea, 1924. 796 p. References at end of chapters.

Serial

Abstracts of bacteriology. Baltimore. 1917-. Includes: Bacterial metabolism and nutrition; industrial bacteriology; agricultural bacteriology; public health bacteriology (sanitation, disinfection, water, food, etc.); immunology; chemotherapy.

Centrallblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten. I Abteilung. Jena. 1877-. (Since 1902 in 2 parts, "Originale" and "Referate"). Classified.

Centrallblatt für Physiologie. 1887-

Classification used: General; plant physiology; physical chemistry; enzymes; pharmacology and toxicology; immunity; methods; respiration; digestion; internal secretions; metabolism; intermediate metabolism; growth; carbohydrates; proteins; fats and lipoids.

Index Medicus. A classified record of the current medical literature of the world. 1879-. Material classified by subjects with annual author index. Includes deficiency diseases, immunology, metabolism, pharmacology, physiology, therapeutics, toxicology. *Jahresbericht über die Fortschritte der Physiologie*. 1892-1912. (Edited by L. Hermann.)

Jahresbericht über die Fortschritte der Tierchemie, oder der physiologischen, pathologischen und immuno-Chemie und der Pharmakologie. Wiesbaden. 1871-. Present classification: Proteins, fats, carbohydrates, blood, milk, urine, digestion, liver and bile, bones, muscles and nerves, various organs, lower animals, oxidation and respiration, metabolism, plant physiology, pathological chemistry, enzymes, pharmacology, immunity.

Jahresbericht über die gesamte Physiologie und experimentelle Pharmakologie. 1920-. Classification: General; methods; physics; physical chemistry; colloid chemistry; descriptive biochemistry; food chemistry; plant physiology; agricultural chemistry; metabolism; secretions; respiration; ferments; and fermentation; hygiene; immunity; pharmacology; toxicology.

Medical sciences. London. 1919-. Contains reviews with brief bibliographies and abstracts, which include biochemistry.

Physiological abstracts. 1916-. Abstracts cover general field of biochemistry and physiology. Classification varies in different numbers.

Quarterly cumulative index to current medical literature. 1916-. Contains much of biochemical interest.

Zentrallblatt für Biochemie und Biophysik, mit Einschluss der theoretischen Immunitätsforschung. Leipzig. 1903-. (Earlier volumes, 1903-1909, bore the titles "Biochemisches Centrallblatt" and "Biophysikalisches Centrallblatt"). Abstracts classified under appropriate headings.

BIOLUMINESCENCE

HARVEY, E. N. Mechanism of the production of light during the oxida-

- tion of pyrogallol. *J. Biol. Chem.* 31: 311 (1917). 23 references.
- HARVEY, E. N. The nature of animal light. Philadelphia, Lippincott, 1920. 182 p. Bibl., p. 162-178.
- BIOS**
TANNER, FRED W. The "Bios" question. *Chem. Rev.* 1: 466-472 (1925).
- BIOTIT.** See MICA.
- BIPHENYL**
MEYER-JACOBSON. Diphenyl. *In their Lehrb. org. Chem.* 2, pt. 2: 25-27 (1903). 30 references.
- SCHLENK, WILHELM. Ueber chinoide Biphenyl-derivate. *Ann.* 363: 313-339 (1908). 38 footnotes.
- ULLMANN, FRITZ. Ueber symmetrische Biphenyl-derivate. *Ann.* 332: 38-81 (1904). 58 footnotes.
- BISMUTH**
ALLEN, ROBERT. Bismuth ores. (Imperial institute. Monographs on mineral resources, with special reference to the British Empire). London, Murray, 1925. 62 p. Bibl., p. 57-62. "Bismuth." *Ind.-Cat. S. G. O.*, 1st ser., 2: 73-74 (1881); 2nd ser., 2: 355-356 (1897); 3rd ser., 2: 563-566 (1920). Includes toxicology, therapeutic and diagnostic uses.
- BOUCHONNET, A. Bismuth, étain, plomb. Paris, Doin, 1920. Bibl., p. 353-365.
- GODEFROY, M. L. Le bismuth et ses composés. *In* Frémy, *Enc. chim.* 3, 13^e cahier, pt. 1: 113-143 (1887). Chronological (1413-1887) and by author.
- HERZ, —. Wismuth. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 3: 671-678 (1907). 300 references.
- MICHEL, H. Gediegen Wismut. *In* Doelter, *Handb. Mineralchem.* 3, pt. 1: 787-814 (1918). Bibl. footnotes.
- PRANDTL, W. Wismut. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 934-1047 (1908). References through text.
- THOMAS, V. Bismuth. *In* Moissan, *Chim. min.* 2: 55-97 (1905). 559 footnotes.
- BISMUTH: Analytical.**
MOSER, L. Die Bestimmungsmethoden des Wismuts und seine Trennung von der anderen Elementen. Stuttgart, Enke, 1909. 123 p. Bibl. footnotes.
- PRANDTL, W. Wismut: Analytisches. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 949-950 (1908).
- BISMUTH CARBONATE**
KREUTZ, ST. Wismutcarbonat. *In* Doelter, *Handb. Mineralchem.* 1: 540-544 (1912). Bibl. footnotes.
- BISMUTH CHLORIDE**
EGGINK, B. G. Die Schmelzkurven der Systeme Wismut-Chlor und Wismut-Brom. *Z. physikal. Chem.* 64: 449-505 (1908). Bibl. footnotes.
- PRANDTL, W. Wismuttrichlorid. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 987-992 (1908). References through text.
- WEINLAND, R. F., ALBER, A., and SCHWEIGER, J. Ueber Doppelsalze des Wismuttrichlorids mit Chloriden zweiwertigen Metalle. *Arch. Pharm.* 254: 521-536 (1916).
- BISMUTH NITRATE**
PRANDTL, W. Wismutnitrate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 969-974 (1908). References through text.
- BISMUTH SULFATE**
PRANDTL, W. Wismutsulfate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 981-984 (1908). References through text.
- BISMUTH SULFIDES**
PRANDTL, W. Wismut und Schwefel. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 974-980 (1908). References through text.
- BISMUTH TRIOXIDE**
PRANDTL, W. Wismuttrioxyd. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 953-961 (1908). References through text.
- RUTTEN, G. M., and VAN BEMMELEN, J. M. Das System Wismutoxyd, Salpetersäure und Wasser. *Z. anorg. Chem.* 30: 342-405 (1902). Bibl. footnotes.
- BITTER PRINCIPLES**
OESTERLE, O. A. Die Bitterstoffe. *In* Abderhalden, *Biochem. Handl.* 7: 229-265 (1912). 400 footnotes.
- BITUMENS**
BAUM, FRITZ. [Natural bitumens.] *In* Abderhalden, *Biochem. Handl.* 1: 8-21 (1911). About 100 footnotes.
- HENNING, EMILE. Bituminous materials and paving blocks. *In his* *Plastics and moulded electrical insulators*, 1923, p. 127-135. Patents only.
- KNAPP, I. Natural gas, with incidental reference to other bitumens. *J. Franklin Inst.* 174: 477-498, 639-662 (1912). 71 footnotes.
- See also ASPHALTS; HYDROCARBONS, NATURAL; PETROLEUM (Redwood).
- BLAST FURNACE**
CLEMENTS, FRED. British blast furnace practice. *Iron Steel Inst.* 101: 144-148 (1920). Chronological list of works in English.
- FIELD, ALEX L. Viscosity of blast furnace slag and its relation to iron

BLAST FURNACE—Cont'd

metallurgy. *Trans. Faraday Soc.* 13: 3-35 (1917). *Bibl. footnotes.*

See also METALLURGY.

BLEACHING

HIGGINS, SIDNEY H. *Bleaching.* New York, Longmans, 1921. 137 p. *References through text.*

HIGGINS, S. H. *Cotton bleaching and finishing.* *J. Soc. Dyers & Colourists* 40: 413-418 (1924).

MATTHEWS, J. MERRITT. *Bleaching and related processes as applied to textile fibers and other materials.* New York, Chem. Cat. Co., 1921. 676 p. *Bibl., p. 659-661.* 110 *footnotes.*

SOCIETY OF CHEMICAL INDUSTRY. *Bleaching, dyeing, printing and finishing.* *In Annual reports of the progress of applied chemistry* 2: 159-174 (1917); 114 *footnotes.* 3: 147-161 (1918); 81 *footnotes.* 4: 137-148 (1919); 91 *footnotes.* 5: 150-161 (1920); 57 *footnotes.* 6: 158-165 (1921); 64 *footnotes.* 7: 149-161 (1922); 80 *footnotes.* 8: 162-183 (1923); 135 *footnotes.* 9: 160-177 (1924); 162 *footnotes.*

See also PAPER, BLEACHING.

BLEACHING POWDER

EPHRAIM, FRITZ. *Chlorkalk.* *In Gmelin-Kraut, Handb. anorg. Chem.* 2, pt. 2: 265-273 (1909). *References through text.*

HOOKE, A. R. *Chloride of lime in sanitation.* New York, Wiley, 1913. 231 p. 442 *references.*

MELLOR, J. W. *Bleaching powder.* *In his Inorg. theor. chem.* 2: 258-267 (1922). 125 *references.*

BLOOD

"Blood." *Ind.-Cat. S. G. O.*, 1st ser., 2: 133-175 (1881); 2nd ser., 2: 429-478 (1897); 3rd ser., 3: 1-111 (1922).

BORUTTAU, H. *Blut und Lymphe.* *In Nagel, Handb. Physiol. Menschen* 5: 1-84 (1910). *Bibl. footnotes.*

EGERER-SEHAM, GRETE, and NIXON, C. E. *Comparative studies in the chemistry of blood and spinal fluid.* *Arch. Int. Med.* 28: 561-585 (1921). 62 *footnotes.*

GERHARTZ, HEINRICH. *Chemie der post-embryonalen Organe der Blutzellbildung.* *In Oppenheimer, Handb. Biochem.* 2, pt. 2: 163-177 (1909). 68 *footnotes.* 2nd ed., 4: 209-221 (1923). 69 *footnotes.*

GERHARTZ, HEINRICH. *Chemie der Lymphe.* *In Oppenheimer, Handb. Biochem.*, 2nd ed., 4: 166-184 (1923). 91 *footnotes.*

GERHARTZ, HEINRICH. *Chemie der Transsudate und Exsudate.* *In Op-*

penheimer, *Handb. Biochem.*, 2nd ed., 4: 185-208 (1923). 121 *footnotes.*

HAMMETT, FREDERICK S. *Variation in the chemical composition of human blood.* *J. Biol. Soc.* 41: 599 (1920). 33 *references.*

HASTINGS, A. B., and MURRAY, H. A. *Observations on parathyroidectomized dogs.* *J. Biol. Chem.* 46: 233 (1921). 50 *references.*

HÖBER, RUDOLF. *Physikalische Chemie des Blutes und der Lymphe.* *In Oppenheimer, Handb. Biochem.* 2, pt. 2: 1-39 (1909). 139 *footnotes.*

HURWITZ, SAMUEL H. *Pathological metabolism of the blood and blood-forming organs.* *In Barker, Endocrinology and metabolism*, 4: 553-605; *references*, 5: 511-694 (1922).

KANITZ, ARISTIDES. *Blutkörperchen.* *In Oppenheimer, Handb. Biochem.* 2: 259-274 (1908); *Ergänzungsband*, 1913, 105-111. About 75 *footnotes.*

MORAWITZ, PAUL. *Blutplasma und Blutserum.* *In Oppenheimer, Handb. Biochem.* 2, pt. 2: 70-98 (1909). 300 *footnotes.* 2nd ed., 4: 78-125 (1923). 380 *footnotes.*

MYERS, VICTOR C. *Body tissues and fluids.* *In Barker, Endocrinology and metabolism* 3: 423-479; *references*, 5: 345-509 (1922).

MYERS, VICTOR C. *Chemical changes in the blood in disease.* *J. Lab. Clin. Med.* 5: 343, 418, 490, 566, 640, 700, 776 (1920); 6: 17-22 (1920). 220 *references.*

MYERS, VICTOR C. *Chemical changes in the blood and their clinical significance.* *Physiol. Rev.* 4: 318-328 (1924).

PINCUSSEN, LUDWIG. *Physikalische Chemie des Blutes und der Lymphe.* *In Oppenheimer, Handb. Biochem.*, 2nd ed., 4: 1-43 (1923). 198 *footnotes.*

SACHS, H. *Ueber Beziehungen zwischen physikalisch-chemischer Konstitution und Biologie des Blutserums.* *Kolloid-Z.* 24: 113-128 (1919). 76 *footnotes.*

SCHULTZ, N. *Bildung von Lymphe.* *In Oppenheimer, Handb. Biochem.* 2nd ed., 4: 143-165 (1923). 111 *footnotes.*

SEEMANN, J. *Die blutbildenden Organe.* *Ergeb. Physiol.* 3: 1-11 (1904). 290 *references.*

STAPP, WILHELM. *Der Restkohlenstoff des Blutes und seine Bedeutung für Physiologie und Pathologie.* *Ergeb. Physiol.* 19: 291-292 (1921). 32 *references.*

WELLS, H. G. *Disturbances of circulation and diseases of the blood.* *In Op-*

- his* Chemical pathology, 4th ed., p. 290-329 (1920). 234 footnotes.
- WESSELOW, O. L. V. DE. Biochemistry of blood in relation to calcium and phosphates. *Med. Sci.* 6: 470-482 (1922).
- BLOOD: Amino acids.**
- BOCK, JOS. C. Determination and occurrence of amino acids in the blood. Thesis, Cornell Univ., 1917. 47 p. Bibl., p. 32-47.
- GREENE, CARL H., SANDIFORD, K., and ROSS, HELEN. The amino acid content of the blood in normal and pathologic conditions. *J. Biol. Chem.* 58: 855-857 (1924). 31 references.
- GYÖRGY, P., and ZUNZ, E. Amino acid content of the blood. *J. Biol. Chem.* 21: 511-537 (1915). 68 references.
- BLOOD: Ammonia.**
- "Blood, ammonia in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 5 (1922). 21 titles.
- NASH, THOMAS P., and BENEDICT, STANLEY R. The ammonia content of the blood and its bearing on the mechanism of acid neutralization in the animal organism. *J. Biol. Chem.* 48: 463 (1921). *Also in* NASH, Thesis, Cornell Univ., 1922. 44 references.
- BLOOD: Analysis.**
- "Blood, analysis and chemistry of." *Ind.-Cat. S. G. O.*, 1st ser., 2: 137-140 (1881); 2nd ser., 2: 435-438 (1897); 3rd ser., 3: 9-11 (1922).
- "Blood (detection of, clinical), by chemical methods." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 59-60 (1922). 72 references.
- KASTLE, J. H. Chemical tests for blood. *In* U. S. Hyg. Lab. Bull. No. 51, 1909. Bibl., p. 51-59. 212 references.
- MYERS, VICTOR C. Practical chemical analysis of blood. 2nd ed. St. Louis, Mosby, 1924. 232 p. Bibl. at end of chapters.
- PFEIFFER, HERMAN. Der biologische Blutnachweis. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 12: 105-176 (1923). Bibl. footnotes.
- RICHTER-QUITTNER, M. [Methods of chemical blood analysis.] *Biochem. Z.* 95: 179-204; 96: 92-105 (1919). Bibl. footnotes.
- See also* URINE (Neuberg).
- BLOOD: Bile in.**
- "Blood, bile in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 7-8 (1922). 50 entries.
- BLOOD: Calcium in.**
- "Blood, calcium in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 8 (1922). 30 references.
- BLOOD: Cholesterol.** *See* CHOLESTEROL.
- BLOOD: Coagulation.**
- "Blood, coagulation of, including effect of physical and chemical agents." *Ind.-Cat. S. G. O.*, 1st ser., 2: 148-149 (1881); 2nd ser., 2: 445-447 (1897); 3rd ser., 3: 23-30 (1922).
- COHEN, MYER S. The coagulation time of blood as affected by various conditions. *Arch. Int. Med.* 8: 844-850 (1911).
- HOWELL, WM. H. The coagulation of blood. *In* Harvey Lectures, 1916-1917, p. 272-323. 58 references.
- LOEB, LEO. Einige neuere Arbeiten ueber die Blutgerinnung bei Wirbellosen und bei Wirbeltieren. *Biochem. Centr.* 6: 829-850, 889-912 (1907). 175 references.
- MORAWITZ, P. Die Blutgerinnung. Methoden ihrer Erforschung. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 3: 187-262 (1921). Bibl. footnotes.
- MORAWITZ, P. Die Chemie der Blutgerinnung. *Ergeb. Physiol.* 4: 307-323 (1905). 490 references.
- MORAWITZ, PAUL. Die Gerinnung des Blutes. *In* Oppenheimer, *Handb. Biochem.* 2, pt. 2: 40-69 (1909). 243 footnotes. 2nd ed., 4: 47-77 (1923). 189 footnotes.
- STUEBEL, HANS. Die Fibringerinnung als Krystallisationsvorgang. *Arch. ges. Physiol.* 181: 285-309 (1920). Bibl. footnotes.
- BLOOD: Enzymes.**
- SENER, GEORGE. Das Wasserstoff-superoxyd-zersetzende Enzym des Blutes. *Z. physikal. Chem.* 44: 257-318 (1903). Bibl. footnotes.
- WERTHEIMER, ERNST. Blutfermente. Die Abderhalden'sche Reaktion. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 4: 126-142 (1923). 109 footnotes.
- See also* CATALASE.
- BLOOD: Equilibrium.**
- GT. BRIT. Medical research council. Hemoglobin committee. The acid-base equilibrium of the blood. Special report ser. No. 72. 1923. 70 p. Bibl., p. 43-44, 69-70.
- HENDERSON, LAWRENCE J. Das Gleichgewicht zwischen Basen und Säuren im tierischen Organismus. *Ergeb. Physiol.* 8: 254-257 (1907). 113 references.
- KUGELMASS, I. NEWTON, and SHOHL, A. T. The determination of the equilibria involving calcium, hydrogen, carbonate, bicarbonate and primary, secondary and tertiary phosphate ions. *J. Biol. Chem.* 58: 665-666 (1924). 36 references.
- VAN SLYKE, D. D. Normal and abnormal variations in the acid-base balance of the blood. *J. Biol. Chem.* 48: 172-176 (1921). About 60 references.

BLOOD: Equilibrium—Cont'd

VAN SLYKE, D. D., and CULLEN, GLENN E. Bicarbonate concentration of the blood plasma. *J. Biol. Chem.* 30: 346 (1917). 48 references.

VAN SLYKE, D. D., WU, H., and MCLEAN, F. C. Factors controlling the electrolyte and water distribution in the blood. *J. Biol. Chem.* 56: 848-849 (1923). 37 references.

WILSON, D. WRIGHT. Neutrality regulations in the body. *Physiol. Rev.* 3: 328-334 (1923).

BLOOD: Food value.

"Blood as food or medicine." *Ind.-Cat. S. G. O.*, 1st ser., 2: 174-175 (1881); 2nd ser., 2: 477-478 (1897); 3rd ser., 3: 110-111 (1922).

BLOOD: Gases.

BARCROFT, JOSEPH. Zur Lehre von Blutgaswechsel in den verschiedenen Organen. *Ergeb. Physiol.* 7: 701-702 (1908). 54 references.

"Blood, carbon dioxide in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 8-9 (1922). 35 references.

"Blood, carbon monoxide in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 9 (1922). 25 references.

"Blood, gases in." *Ind.-Cat. S. G. O.*, 1st ser., 2: 157-158 (1881); 2nd ser., 2: 456 (1897); 3rd ser., 3: 76 (1922).

"Blood, oxygen in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 81 (1922). 55 references.

BOHR, CHRISTIAN. Blutgase und respiratorischer Gaswechsel. *In* Nagel. *Handb. Physiol. Menschen* 1: 54-222 (1905). *Bibl. footnotes.*

LOEWY, A. Die Gase des Körpers. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 1: 10-132 (1911). 334 footnotes.

BLOOD: Iron in.

"Blood, iron in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 78-79 (1922). 35 references.

BLOOD: Nitrogen.

"Blood, nitrogen in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 79-80, 90 (1922). 90 references.

FOLIN, OTTO. Non-protein nitrogen of blood in health and disease. *Physiol. Rev.* 2: 460-478 (1922). 45 references.

KARSNER, H. T. The behavior of certain nitrogenous metabolites in the blood in nephritis. *J. Lab. Clin. Med.* 1: 910-916 (1916).

See also BLOOD, AMINO ACIDS; BLOOD, PROTEINS.

BLOOD: Osmotic pressure.

"Osmotic pressure of blood." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 80-81 (1922). 40 references.

BLOOD: Pigments.

"Blood, color and coloring matters of." *Ind.-Cat. S. G. O.*, 1st ser., 2: 149-150 (1881); 2nd ser., 2: 447-448 (1897); 3rd ser., 3: 30-31 (1922).

FISCHER, HANS. Ueber Blut und Gallenfarbstoff. *Ergeb. Physiol.* 15: 185-191 (1916). 180 references.

KAYSER, HEINRICH G. J. Die Farbstoffe von Blut, Harn, Galle. *In* his *Handb. der Spectroscopie* 4: 99-190 (1908). *Bibl. footnotes.*

KÜSTER, WM. Blutfarbstoffe. *In* Abderhalden, *Biochem. Handl.* 10: 1-33 (1923). *Bibl. footnotes.*

MÜLLER, FRANZ. Die respiratorischen Farbstoffe. *In* Oppenheimer, *Handb. Biochem.* 1: 662-729 (1909). 202 footnotes. *See also* *Ergänzungsband*, 1913, 113-132. 42 footnotes. 2nd ed., 1: 405-476 (1924). 269 footnotes.

REINBOLD, B. v. Blutfarbstoffe. *In* Abderhalden, *Biochem. Handl.* 6: 188-277 (1911); 9: 188-277 (1915). *Bibl. footnotes.*

WELLS, H. G. Blood pigments. *In* his *Chemical pathology*, 4th ed., p. 481-488 (1920). 50 footnotes.

ZALESKII, I. [Chemistry of the coloring matter of the blood.] *J. Russ. Phys. Chem. Soc.* 48: 1337-1653 (1916). *Bibl. footnotes.*

See also HEMOGLOBIN; URINE (Neuberg).

BLOOD: Pressure.

"Effects of chemical and physical agents on blood pressure." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 128-129 (1922). 60 references.

BLOOD: Proteins.

HAMMARSTEN, OLOF. Ueber die Eiweissstoffe des Blutserums. *Ergeb. Physiol.* 1: 330-332 (1902). 52 references.

"Blood, proteins of." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 84, 90-91 (1922).

ROWE, ALBERT H. The albumin and globulin content of human blood serum. *Arch. Int. Med.* 18: 455-473 (1916). 66 footnotes.

BLOOD: Refractive index.

"Blood, refractometry of." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 85 (1922). 25 references.

BLOOD: Urea in.

"Blood, urea in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 104 (1922). 40 references.

BLOOD: Uric acid in.

"Blood, uric acid in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 104-105 (1922). 30 references.

BLOOD: Viscosity.

"Blood, viscosity of." *Ind.-Cat. S. G.*

O., 3rd ser., 3: 105-107 (1922). 115 references.

BLOOD STAINS

[Chemical and microscopical identification of blood stains.] Ind.-Cat. S. G. O., 3rd ser., 3: 139-140 (1922). 90 references.

BLOOD SUGAR

GRAY, HORACE. Blood sugar standards; normal and diabetic persons. Arch. Inter. Med. 31: 241-262 (1923).

MACLEOD, J. J. R. The sugar of the blood. Physiol. Rev. 1: 236-238 (1921). Univ. Toronto Studies, Physiol. ser., No. 40, p. 236-238. 65 references.

MERTZ, ALBRECHT. Blutzuckeruntersuchungen im Säuglings- und Kindesalter. Arch. Kinderheilk. 68: 265 (1921). 46 references.

POLLAK, LEO. Physiologie und Blutzuckerregulation. Ergeb. innere Medizin 23: 338-348 (1923). 465 references.

SCOTT, ERNEST L. The content of sugar in the blood under common laboratory conditions. Am. J. Physiol. 34: 308-311 (1914). Thesis, Columbia Univ., 1914.

STIEPP, WILHELM. Ueber einige den Blutzucker betreffende Fragen im Lichte neuerer Forschungsergebnisse. Ergeb. Physiol. 20: 108-109 (1922). 31 references.

"Blood, sugar in." Ind.-Cat. S. G. O., 1st ser., 2: 166-167 (1881); 2nd ser., 2: 472-473 (1897); 3rd ser., 3: 94-98 (1922).

BLOTTING PAPER. See PAPER, BLOTTING.

BOILING POINTS. See VAPOR PRESSURE.

BONE BLACK

HORNE, W. D. United States patents on bone black and decolorizing carbons. Ind. Eng. Chem. 16: 670 (1924).

BONES

ARON, HANS. Stützgewebe und Integuments der Wirbeltiere. In Oppenheimer, Handb. Biochem. 2, pt. 2: 178-228 (1909). 152 footnotes. 2nd ed., 4: 222-269 (1923). 221 footnotes.

"Bones, chemistry of." Ind.-Cat. S. G. O., 2nd ser., 2: 539 (1897); 3rd ser., 3: 189 (1922). 28 references.

SCHULZ, N. Stützsubstanzen und Integumente niederer Tiere. In Oppenheimer, Handb. Biochem. 2, pt. 2: 229-243 (1909). 51 footnotes. 2nd ed., 4: 270-287 (1923). 91 footnotes.

WELLS, H. G. Calcification and ossification. Arch. Int. Med. 7: 721-753 (1911); Harvey Lectures, 1910-1911, 102-146. 76 footnotes.

BOOKS: Disinfection.

"Books, disinfection of." Ind.-Cat. S. G. O., 3rd ser., 3: 237 (1922). 27 references.

NICE, L. B. Experiments in book disinfection. J. Am. Pub. Health Assoc. 1: 777 (1911). 12 references.

BORATES

DUKELSKI, M. Ueber Borate. Z. anorg. Chem. 50: 38-48 (1906). 31 references on the Na, K and Li salts.

Gr. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Borates. (1913-1919). 1920. 24 p. Bibl., p. 23-24.

BORAX

BAILEY, G. E. Saline deposits of California. Calif. State Min. Bur., Bull. No. 24, 1902. 216 p. Bibl., p. 193-194. 41 references.

NASINI, RAFFAELLO. I soffioni boraciferi e la industria dell'acido borica in Toscana. Rome, Bertero, 1907. 124 p. Bibl., p. 119-124.

YALE, CHAS. G., and GALE, HOYT S. Borax. U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 523-536; 1914, pt. 2: 289-290. About 150 titles.

BORDEAUX MIXTURE

FOEX, E. Résumé des discussions relatives au pouvoir anticryptogamique des sels de cuivre. Rev. vit. 55: 74-76 (1921). 50 references.

HAWKINS, L. A. Some factors influencing the efficiency of Bordeaux mixture. U. S. Dept. Agr., Bur. Plant Ind., Bull. No. 265, 1913. 29 p.

HEDRICK, W. P. Bordeaux injury. N. Y. State Agr. Expt. Sta., Bull. No. 287, 1907. Bibl., p. 186-189. 66 references.

LUTMAN, BENJAMIN F. Some studies on Bordeaux mixtures. Vermont Agr. Expt. Sta., Bull. No. 196, 1916. Bibl., p. 79-80.

See also INSECTICIDES.

BORIC ACID

"Boric acid." Ind.-Cat. S. G. O., 1st ser., 1: 74-75 (1880); 2nd ser., 1: 102 (1896); 3rd ser., 1: 108-109 (1918).

GUTHIER, A. Borsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 413-436 (1911). References through text.

MELLOR, J. W. Boric acid and borates. In his Inorg. theor. chem. 5: 62-64, 81-83, 85, 94-95, 101-102, 104, 106-107, 111, 115 (1924).

BORIC ACID: Analytical.

GUTHIER, A. Nachweis, Bestimmung und Trennung der Borsäure und Borate. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 434-436, 875-876 (1911). Classified.

BORIC ACID: Analytical—Cont'd

SARGENT, G. W. The quantitative estimation of boric acid in tourmaline. *J. Am. Chem. Soc.* 21: 858-888 (1899). 47 references.

WINDISCH, K. [The determination of boric acid.] *Z. Nahr. Genussm.* 9: 641-660 (1905).

WOGGINZ, ALFRED, and KITTEL, J. Ueber die Bestimmung von Borsäure in Nickelbädern. *Chem.-Ztg.* 36: 433-434 (1912). *Bibl. footnotes.*

BORIC OXIDE

MELLOR, J. W. Boric oxide. *In his Inorg. theor. chem.* 5: 45-46 (1924).

BORIDES

WATTS, OLIVER P. Investigations of the borides and silicides. *Wisconsin Univ., Eng. Ser., Bull No.* 3: 314-318 (1906). 55 references, 1808-1906.

BORNEOL

BARTLETT, K. Borneol. *In Abderhalden, Biochem. Handl.* 7: 398-404 (1912). 100 footnotes.

MEYER-JACOBSON. Borneol. *In their Lehrb. org. Chem.* 2, pt. 1: 1031-1034 (1902). *Bibl. footnotes.*

See also ESSENTIAL OILS.

BORON

GAUTIER, HENRI. Bore. *In Moissan, Chim. min.* 2: 153-186 (1905). 161 footnotes.

GUTBIER, A. Bor. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 386-398 (1911). References through text.

HERZ, —. Bor und seine Verbindungen. *In Abegg, Handb. anorg. Chem.* 3, pt. 1: 48-53 (1906). 223 references.

JOLY, A. Bore. *In Frémy, Enc. chim.* 2, 3^e cahier: p. 105-107 (1884).

LITTLE, H. F. V. Boron. *In Friend, Textbook,* 4: 6-46 (1917). *Bibl. footnotes.*

MELLOR, J. W. Boron. *In his Inorg. theor. chem.* 5: 1-147 (1924). *Bibl. through text.*

BORON BROMIDE

GUTBIER, A. Bor und Brom. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 463-465 (1911). References through text.

BORON CARBIDE

GUTBIER, A. Borkarbide. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 812-815 (1911). References through text.

BORON CHLORIDE

GUTBIER, A. Bor und Chlor. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 457-463 (1911). References through text.

BORON HYDRIDE

GUTBIER, A. Borwasserstoff. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 398-402 (1911). References through text.

BORON NITRIDE

GUTBIER, A. Bor und Stickstoff. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 436-440 (1911). References through text.

BORON SULFIDES

GUTBIER, A. Bor und Schwefel. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 444-449 (1911). References through text.

BORON TRIOXIDE

GUTBIER, A. Bortrioxyd. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 402-413 (1911). References through text.

BOTANICAL CHEMISTRY

CZAPEK, FRIEDRICH. Biochemie der pflanzen. 3rd ed. Jena, Fischer, 1922+. Numerous *bibl. footnotes.*

GRAFE, VIKTOR. Chemie der Pflanzenzelle. Berlin, Borntraeger, 1922. 420 p. *Bibl.*, p. 395-412.

MOLISCH, H. Mikrochemie der Pflanze. 2nd ed. Jena, Fischer, 1921. 434 p. *Bibl. at end of chapters.*

ONSLow, MURIEL. Practical plant biochemistry. 2nd ed. Cambridge, Univ. Press, 1923. 194 p. *Bibl. footnotes.*

TRIER, GEORG. Chemie der Pflanzenstoffe. Berlin, Borntraeger, 1924. 605 p. *Bibl. footnotes.*

WEHNER, CARL. Die Pflanzenstoffe botanisch-systematisch bearb. Chemische Bestandteile und Zusammensetzung der einzelnen Pflanzenarten. Jena, Fischer, 1911. 937 p. *Bibl. footnotes.*

Serial

Botanical abstracts. Baltimore. 1918-. Includes pharmaceutical botany and pharmacognosy; physiology; soil science; agronomy.

BRAIN

"Brain, chemistry of." *Ind.-Cat. S. G. O.*, 1st ser., 2: 336-337 (1882); 2nd ser., 2: 633 (1897); 3rd ser., 3: 322-323 (1922). About 125 references.

See also LIPIDS.

BRASILIN

RUPE, H., and ALTENBURG, H. Brasilin. *In Abderhalden, Biochem. Handl.* 6: 150-158 (1911). About 100 footnotes.

See also PLANT PIGMENTS.

BRASS. See COPPER ALLOYS.**BREAD**

"Bread and bread making." *Ind.-Cat. S. G. O.*, 1st ser., 2: 411-413 (1881);

2nd ser., 2: 754-757 (1897); 3rd ser., 3: 452-456 (1922). Includes analysis, digestibility, nutritional value, substitutes and war bread.

GRANT, J. The chemistry of bread making. 3rd ed. New York, Longmans, 1920. 230 p. Bibl., p. 217-218.

MOHORCIC, H. [The use of apples and pears in bread making.] Arch. Hyg. 88: 56-89 (1918). 77 references.

WHYMPER, R. Colloid problems in bread making. In Third report on colloid chemistry, p. 61-74 (1920). References through text.

See also FLOUR.

BREWING

BIRD, WM. H. Catalogue of the Library of the London Section (of the Institute of Brewing). London, 1914. 43 p.

FÜRNROHR, O. Umschau auf dem gesamten Brauereigebiete. 1906-1911. Chem.-Ztg. 36: 1481, 1495 (1912). 176 footnotes.

SCHNEGG, —. Fortschritte auf dem Gebiete der Brauerei u. Mälzerei. Chem.-Ztg. 30: 351-354 (1906). 186 footnotes.

VOGEL, —, and LUFF, G. Neuerungen auf dem Gebiete der Brauerei und Mälzerei. Chem.-Ztg. 26, 422-462 (1902). 210 footnotes.

WAHL, ROBERT, and HENIUS, MAX. American handy book of the brewing, malting and auxiliary trades. 3rd ed. Chicago, Wahl-Henius Inst., 1908. 2 vols. Bibl., vol. 1: 716-774.

Serial

Journal of the institute of brewing. London. 1895-. Each number contains "Abstracts of current literature."

See also FERMENTATION.

BRICK

CARNEGIE LIBRARY OF PITTSBURGH. Brick manufacture and bricklaying. In their Monthly Bulletin 17: No. 1 (Jan., 1912). 24 p. Does not cover fire brick.

NATIONAL BRICK MANUFACTURERS' ASSOCIATION, U.S. A study of the chemical status of the carbon, iron and sulfur in clays during the various stages of burning. Third report of the Committee on technical investigation. Indianapolis, Randall, 1908. 108 p. Bibl., p. 20-21. Bibl. footnotes.

SEARLE, A. B. Clayworkers' handbook. 2nd ed. London, 1911. 394 p.

See also SAND-LIME BRICK, CERAMICS.

BRICK, SILICA

CELLERIER, —. Résumé des travaux sur la fabrication des briques de silice. Paris, 1919.

BRIQUETS

STILLMAN, ALBERT L. Briquetting. Easton, Chem. Pub. Co., 1923. 466 p. Bibl. at end of chapters.

WRIGHT, CHARLES. Briquetting tests at the U. S. fuel testing plant, Norfolk, Va., 1907-1908. U. S. Geol. Sur., Bull. No. 385, 1909. Bibl., p. 38-41. 126 titles, chronological from 1899 to 1908.

WRIGHT, CHARLES L. Briquetting tests of lignite at Pittsburgh, Pa., 1908-1909, with a chapter on sulfite-pitch binder. U. S. Bur. Mines, Bull. No. 14, 1911. Bibl., p. 57-62. Chronological from 1899 to 1910.

WRIGHT, CHARLES L. Fuel briquetting investigations, July, 1904, to July, 1912. U. S. Bur. Mines, Bull. 58, 1913. Bibl., p. 266-270. 148 titles, from 1899 to 1912.

BROMIC ACID

DITZ, HUGO. Bromsäure. HBrO_3 . In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 261-268 (1909). References through text.

MELLOR, J. W. Bromic acid. In his Inorg. theor. chem. 2: 296-370 (1922). Covers preparation, properties and salts.

BROMINE

ABEL, E. Brom. In Abegg, Handb. anorg. Chem. 4, pt. 2: 321-332 (1912). 495 references.

BRÄUER, A. Brom. In Bräuer and d'Ans, Fortschritte, 1: 345-346 (1921). German patents.

"Bromine and the bromides." Ind.-Cat. S. G. O., 1st ser., 2: 471-472 (1881); 2nd ser., 2: 826-827 (1897); 3rd ser., 3: 523-525 (1922). 250 references.

DITZ, HUGO. Brom. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 217-236 (1909). References through text.

GAUTIER, A. Brome. In Moissan, Chim. min. 1: 129-150 (1904). 155 footnotes.

JOLY, A. Brome. In Frémy, Enc. chim. 2, 1^e cahier: 604-605 (1885).

MARTIN, G., and DANCATER, E. A. Bromine. In Friend, Textbook 4: 141-188 (1915). Bibl. footnotes.

MELLOR, J. W. Bromine. In his Inorg. theor. Chem. 2: 15-126 (1922). Occurrence, 20 references; history, 7 references; preparation, 40 references; properties, 150 references; chemical properties, 35 references.

BROMOFORM

BAUM, FRITZ. Bromoform. In Abderhalden, Biochem. Handl. 1: 40-42 (1911). 38 footnotes.

BROMURAL

"Bromural." Ind.-Cat. S. G. O., 3rd ser., 3: 527 (1922). 33 references.

BRONZE. See COPPER, ALLOYS.**BROOKITE**

HAAS, GUSTAV. Brookit. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 33-34 (1912).

HENGLEIN, M. Brookit. In Doelter, Handb. Mineralchem. 3, pt. 1: 33-36 (1918). Bibl. footnotes.

BROWNIAN MOVEMENT

BANCROFT, W. D. Brownian movements. J. Phys. Chem. 22: 273-299 (1918); J. Franklin Inst. 185: 221-224 (1918). Bibl. footnotes.

"Brownian movements." Ind.-Cat. S. G. O., 2nd ser., 2: 857 (1897); 3rd ser., 3: 561 (1922).

FÜRTH, REINHOLD. Bericht ueber neuere Untersuchungen auf dem Gebiete der Brownischen Bewegung. Jahrb. Radioakt. Elektronik 16: 359-361 (1919-1920). 68 references.

MELLOR, J. W. Brownian movement. In his Inorg. theor. chem. 1: 779-782 (1922). About 250 references.

SVEDBERG, THE. The Brownian movement. Ion 1: 373-374 (1909). 54 references.

SVEDBERG, THE. Neuere Untersuchungen ueber die Brownsche Bewegung. Jahrb. Radioakt. Elektronik 10: 467-474 (1913). 130 references, 1900-1913.

See also COLLOIDS.

BRUCINE

"Brucine." Ind.-Cat. S. G. O., 1st ser., 2: 495 (1881); 2nd ser., 2: 860 (1897); 3rd ser., 3: 563-564 (1922).

SCHMIDT, JULIUS. Brucin. In Abderhalden, Biochem. Handl. 5: 178-187 (1911). Bibl. footnotes.

See also ALKALOIDS.

BUFFER MIXTURES. See HYDROGEN ION CONCENTRATION.**BUTADIENE. See RUBBER, SYNTHETIC.****BUTANE**

BAUM, FRITZ. Butan. In Abderhalden, Biochem. Handl. 1: 86-89 (1911). 60 footnotes.

See also HYDROCARBONS.

BUTINE

NOYES, ARTHUR A. Index to the literature of butines and their halogen addition products. 1863-1888. Tech. Quart., Dec., 1888.

BUTTER

"Butter." Ind.-Cat. S. G. O., 1st ser., 2: 562-563 (1881); 2nd ser., 2: 947-948 (1897); 3rd ser., 3: 625-630

(1922). Includes adulterations, substitutes, analysis, fat and fatty acids of, preservation, rancidity and sterilization.

MOCK, H., and BLUM, A. List of U. S., British and German patents covering the manufacture of butter substitutes, hydrogenated oils and various oils and milk products. New York, Mock and Blum, 1918. 120 p.

RAHN, O., BROWN, C. W., and SMITH, L. M. Keeping qualities of butter. II. The influence of salt. III. The decomposition of proteins. Mich. Agr. Expt. Sta., Tech. Bull. No. 2: 5-44 (1909).

SAYER, W. S., RAHN, O., and FARRAND, BELL. Keeping qualities of butter.

I. General studies. Mich. Agr. Expt. Sta., Tech. Bull. No. 1: 5-61 (1908).

SOMMER, H. H., and SMIT, B. J. The fleshy flavor of butter. Wis. Agr. Expt. Sta., Res. Bull. No. 57, 1923. 51 p. 136 references.

WALLER, ELWYN, MARTIN, E. W., MOELLER, W., and MOORE, R. W. Butter. In N. Y. Dairy Commission, 2nd Annual Rept., p. 283-290 (1882).

See also DAIRY PRODUCTS, MARGARINE, MILK.

BUTTER: Analytical.

HOLLAND, E. B., and BUCKLEY, J. P., JR. Determination of fatty acids in butter fat. J. Agr. Res. 12: 719-732 (1918). 30 references.

SCHOONJANS, A. Les limites d'erreurs expérimentales dans le dosage de l'eau dans les beurres. Bull. soc. chim. Belg. 22: 342-360 (1908). Bibl. footnotes.

BUTYL ALCOHOL

GERNGROSS, OTTO. Butylalkohol. In Abderhalden, Biochem. Handl. 1: 432-442 (1911). 150 footnotes, including derivatives.

WORDEN, E. C. Butyl alcohol. In his Technology of cellulose esters 1: 2437-2446 (1921). Bibl. footnotes.

See also ALCOHOLS.

BUTYRIC ACID

SCHMIDT, ERNST. Buttersäure. In Abderhalden, Biochem. Handl. 1: 938-968 (1911). 200 footnotes, including derivatives.

See also ACIDS, ORGANIC.

CACAO

BÖHME, R. Fortschritte auf dem Gebiete der Kakao- und Schokoladenfabrikation in den Jahren 1905-1912. Chem.-Ztg. 37: 517-519, 542-544, 574-575 (1913). 131 footnotes.

"Cacao." Ind.-Cat. S. G. O., 1st ser., 2: 568 (1881); 2nd ser., 3: 4 (1898); 3rd ser., 3: 636-637 (1922). 100 references. Includes analytical methods.

DEKKER, JOHAN. Literatur über Cacao. *In his* Ueber einige Bestandteile des Cacao und ihre Bestimmung. Amsterdam, DeBussy, 1902. Bibl., p. 64-81. 150 references. Chronological.

KNAPP, ARTHUR W. Cocoa and chocolate, their history from plantation to consumer. London, Chapman, 1920. 210 p. Bibl., p. 189-203.

MORTIMER, W. GOLDEN. History of cocoa. New York, Vail, 1901. 576 p. Bibl., p. 519-544.

SPENCER, G. L. Bibliography of the literature on tea, coffee and cocoa preparations. U. S. Dept. Agr., Bur. Chem., Bull. No. 13, pt. 7: 995-997 (1892).

ULRICH, CHR. Der Nachweis von Schalen in Kakao und in seinem Präparaten. Arch. Pharm. 249: 526-597 (1911). Dissertation, Braun-schweig, 1911. 97 p. 78 footnotes.

WHYMPER, ROBERT. Cocoa and chocolate, their chemistry and manufacture. London, Churchill, 1912, 327 p. Bibl., p. 315-316.

See also FOODS (Vereinbarungen).

CADAVERINE. See AMINES, BASES.

CADMIUM

BUGDEN, NORMAN F. Cadmium, its metallurgy, properties and uses. London, Griffin, 1924. 239 p. Contains bibls.

DRUCKER, K. Kadmium. *In* Abegg, Handb. anorg. Chem. 2, pt. 2: 519-533 (1905). 721 references.

GIRAN, H. Cadmium. *In* Moissan, Chim. min. 3: 1057-1075 (1904). 336 footnotes.

HOFFMAN, H. O. Metallurgy of zinc and cadmium. New York, McGraw, 1922. 341 p. Bibl. footnotes. Zn, p. 1-306; Cd, p. 307-332.

MATHERS, FRANK C., and MARBLE, HUGH M. Electrodeposition of cadmium. Trans. Am. Electrochem. Soc. 25: 297-318 (1914). 84 footnotes.

MELLOR, J. W. Zinc and cadmium. *In his* Inorg. theor. chem. 4: 398-694 (1923). Bibl. through chapter.

ROTH, W. Cadmium. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 107-185, 777-956 (1911). References through text.

SABATIER, PAUL. Cadmium. *In* Frémy, Enc. chim. 3, 6^e cahier: p. 323-324 (1885).

SIEBENTHAL, C. E., and STOLL, A. Cadmium in 1920. U. S. Geol. Sur., Mineral Resources 1920, pt. 1: 6 (1921). 23 references.

CADMIUM: Alloys.

MELLOR, J. W. Alloys and intermetallic compounds of the cadmium and zinc families. *In his* Inorg. theor. chem.

4: 689-694 (1923). About 750 references.

See also ALLOYS.

CADMIUM BROMIDE

MELLOR, J. W. Zinc and cadmium bromides. *In his* Inorg. theor. chem. 4: 573-574 (1923). About 200 references.

ROTH, W. Cadmiumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 139-142, 858-865 (1911). References through text.

CADMIUM CARBONATE

MELLOR, J. W. Zinc and cadmium carbonates. *In his* Inorg. theor. chem. 4: 648-650 (1923). About 160 references.

CADMIUM CHLORIDE

MELLOR, J. W. Zinc and cadmium chlorides. *In his* Inorg. theor. chem. 4: 560-564 (1923). About 500 references.

ROTH, W. Cadmiumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 135-139, 843-853 (1911). References through text.

SUDHAUS, KATHE. Ueber die Gleichgewichte der Doppelsalze von Cadmiumchlorid-Natriumchlorid und Cadmiumchlorid-Kaliumchlorid mit ihren wässerigen Lösungen. Neues Jahrb. Mineral. Geol. 37: 1-50 (1914). Bibl. footnotes.

CADMIUM HYDROXIDE

MELLOR, J. W. The hydroxides and peroxides of zinc and cadmium. *In his* Inorg. theor. chem. 4: 532-533 (1923). About 150 references.

CADMIUM IODIDE

MELLOR, J. W. Zinc and cadmium iodides. *In his* Inorg. theor. chem. 4: 584-586 (1923). About 275 references.

ROTH, W. Cadmiumjodid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 142-145, 865-878 (1911). References through text.

CADMIUM NITRATE

MELLOR, J. W. Zinc and cadmium nitrates. *In his* Inorg. theor. chem. 4: 656-657 (1923). About 150 references.

CADMIUM OXIDE

MELLOR, J. W. Zinc and cadmium oxides and suboxides. *In his* Inorg. theor. chem. 4: 508-510, 519-521 (1923). About 400 references.

CADMIUM SULFATE

MELLOR, J. W. Zinc and cadmium sulfates. *In his* Inorg. theor. chem. 4: 628-633 (1923). About 600 references.

MELLOR, J. W. The ammino- and complex salts of zinc and cadmium sulfates. *In his* Inorg. theor. chem. 4:

CADMIUM SULFATE—Cont'd

641-642 (1923). About 125 references.

ROTH, W. Cadmiumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 125-128, 829-840 (1911). References through text.

CADMIUM SULFIDE

MELLOR, J. W. Zinc and cadmium sulfides. *In his* Inorg. theor. chem. 4: 608-612 (1923). About 600 references.

CAFFEINE

BRAHM, C., and SCHMID, J. Kaffein. *In* Abderhalden, Biochem. Handl. 4: 1068-1093 (1911). Bibl. footnotes.

"Caffeine." *Ind.-Cat. S. G. O.*, 1st ser. 2: 602 (1881); 2nd ser., 3: 45-46 (1898); 3rd ser., 3: 676-678 (1922). Includes physiological effects, therapeutic uses and toxicology.

LENDRICH, K., and NOTTBOHM, E. Ueber den Coffeingehalt des Kaffees und den Coffeinverlust beim Rösten der Kaffees. *Z. Nahr.-Genussm.* 18: 299-308 (1909). 30 footnotes.

MEYER-JACOBSON. Kaffein. *In their* Lehrb. org. Chem. 2, pt. 3: 1291-1298 (1920). Bibl. footnotes.

See also ALKALOIDS, PURINES.

CAFFEINE: Analytical.

FENDLER, G., and STÜBER, W. Coffeinbestimmung in Kaffee. *Z. Nahr.-Genussm.* 28: 9-20 (1914). 25 footnotes.

LENDRICH, K., and NOTTBOHM, E. Verfahren zur Bestimmung des Coffeins im Kaffee. *Z. Nahr.-Genussm.* 17: 241-265 (1909). Bibl. footnotes.

SPENCER, G. L. Caffeine analysis. *In* U. S. Dept. Agr., Bur. Chem., Bull. No. 13, pt. 7: 1004-1009 (1892).

CAFFEINE: Pharmacology.

SALANT, W., and RIEGER, J. B. The toxicity of caffeine. An experimental study on different species of animals. *U. S. Dept. Agr., Bur. Chem., Bull.* No. 148, 1912. 98 p. Bibl., p. 97-98.

SALANT, W., and RIEGER, J. B. The elimination of caffeine; an experimental study of herbivora and carnivora. *U. S. Dept. Agr., Bur. Chem., Bull.* No. 157. 1912. 23 p. 16 references.

SALANT, W., and RIEGER, J. B. The elimination and toxicity of caffeine in nephrectomized rabbits. *U. S. Dept. Agr., Bur. Chem., Bull.* No. 166. 1913. 31 p. 30 references.

SECHER, KNUD I. A. Coffeins og beslaegtede stoffers indflydelse paa den tvaerstribebe muskulatur; eksperimentelle undersøgelser. Thesis, Copenhagen, 1913. 108 p. Bibl., p. 97-105.

CALCIFICATION

WELLS, H. G. Calcification, concretions and incrustations. *In his* Chem. Pathology, 4th ed., p. 439-470 (1920). 161 footnotes.

CALCITE. See CALCIUM CARBONATE.**CALCIUM**

BRACE, P. H. Some notes on calcium. *J. Inst. Metals* 25: 153-168 (1921); *Chem. Met. Eng.* 25: 105-109 (1921). 45 footnotes.

"Calcium and salts." *Ind.-Cat. S. G. O.*, 1st ser., 2: 607-609 (1881); 2nd ser., 3: 51-53 (1898); 3rd ser., 3: 688-692 (1922).

COPAUX, H. Calcium. *In* Moissan, *Chim. min.* 3: 508-589 (1904). 824 footnotes.

EPHRAIM, FRITZ. Calcium. *In* Gmelin-Kraut, Handb. anorg. Chem., 2, pt. 2: 188-362 (1909). References through text.

FRARY, FRANCIS C., and BADGER, W. L. Preparation of calcium. *Trans. Am. Electrochem. Soc.* 16: 185-195 (1909). 37 footnotes.

SACKUR, OTTO. Calcium. *In* Abegg, Handb. anorg. Chem. 2, pt. 2: 164-174 (1905). 609 references.

See also ALKALINE EARTHS (Mellor).

CALCIUM: Alloys.

BRECKENRIDGE, JAMES M. Some alloys of calcium. *Univ. Wisconsin, Bull.* No. 438 (Eng. ser. 6, no. 6), 1911. 37 p. Bibl., p. 34-37. 66 titles.

See also ALLOYS.

CALCIUM: Analytical.

CLARK, GUY C. The micro determination of calcium in whole blood, plasma and serum by direct precipitation. *J. Biol. Chem.* 49: 487 (1921). 41 references.

EPHRAIM, FRITZ. Calcium: Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 198-200 (1909).

CALCIUM ALUMINIUM SILICATES

GOLDSCHLAG, M. Calcium-Aluminium-silicate. *In* Doelter, Handb. Mineralchem. 2, pt. 2: 790-878 (1917). Bibl. footnotes.

JACOBY, R. Calciumaluminiumsilikate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 286-302 (1912). References through text.

CALCIUM ARSENATE

EPHRAIM, FRITZ. Calciumarsenate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 568-570 (1908). References through text.

LEITMEIER, H. Calciumarsenate. *In* Doelter, Handb. anorg. Chem. 3, pt. 1: 634-653 (1918). Bibl. footnotes.

CALCIUM ARSENITE

EPHRAIM, FRITZ. Calciumarsenit. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 565-568 (1908). References through text.

CALCIUM BARIUM CARBONATE

KREUTZ, STEF. Calcium-Bariumcarbonat. *In* Doelter, Handb. Mineralchem. 1: 501-507 (1912). Bibl. footnotes.

CALCIUM BORATE

EPHRAIM, FRITZ. Calciumborate. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 312-317 (1909). References through text.

CALCIUM BROMIDE

EPHRAIM, FRITZ. Calciumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 277-281 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCIUM CARBIDE

BROCHET, A. Industrie de carbure de calcium. *In* Moissan, Chim. min. 3: 690-701 (1904). 103 footnotes.

EPHRAIM, FRITZ. Calciumcarbid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 319-324 (1909). References through text.

See also ACETIC ACID (Deschiens), ACETYLENE, CARBIDES.

CALCIUM CARBONATE

BÜTSCHLI, O. Untersuchungen über organische Kalkgebilde nebst Bemerkung über organische Kieselgebilde. *Abhandl. Königl. Gesel. Wiss. Göttingen, Math.-Phys.-Kl.* 6: 165-174 (1908).

EPHRAIM, FRITZ. Calciumkarbonate. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 324-336 (1909). References through text.

GOLDSCHMIDT, V., and WRIGHT, F. E. Ueber Aetzfiguren, Lichtfiguren und Lösungskörper mit Beobachtungen an Calcit. *Neues Jahrb. Mineral. Geol.* 17: 356-362 (1903). 155 titles.

LANG, RICHARD. Lublinit, die monokline Modifikation des Calciumcarbonats. *Neues Jahrb. Mineral. Geol.* 38: 121-184 (1913). Bibl. footnotes.

LEITMEIER, H. Calciumcarbonat. *In* Doelter, Handb. Mineralchem. 1: 272-336 (1912). Bibl. footnotes.

LINCK, G. Ueber die Bildung der Carbonate des Calciums, Magnesiums und Eisens. *In* Doelter, Handb. Mineralchem. 1: 113-135 (1912). 75 footnotes.

ROGERS, A. F. A list of the crystal forms of calcite with their interfacial angles. *School Mines Quart.* 22: 447-448 (1901). 39 references.

SCHIEBOLD, ERNST. Die Verwendung der Lauediagramme zur Bestimmung

der Struktur des Kalkspates. *Sächs. Akad. Wissensch., Leipzig, Abh.*, 36, No. 2. 213 p. Bibl., p. 212-213. 61 references.

WHITLOCK, H. P. Calcites of New York. *N. Y. State Mus., Mem.* No. 13, 1910. 190 p. Bibl., p. 10-19. 196 references.

See also ALKALINE EARTHS (Mellor), ARAGONITE, MARBLE.

CALCIUM CHLORIDE

EPHRAIM, FRITZ. Calciumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 252-273 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCIUM CYANAMIDE

EPHRAIM, FRITZ. Calciumcyanamid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 342-343 (1909).

JACOB, K. D., KRASE, H. J., and BRAHAM, J. M. Decomposition of calcium cyanamide on storage. *Ind. Eng. Chem.* 16: 680 (1924). 35 references.

See also NITROGEN FIXATION.

CALCIUM FLUORIDE

EPHRAIM, FRITZ. Calciumfluorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 248-252 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCIUM HYDROXIDE

EPHRAIM, FRITZ. Calciumhydroxid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 205-210 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCIUM NITRATE

EPHRAIM, FRITZ. Calciumnitrat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 213-217 (1909). References through text.

KAILAN, A. Calciumnitrat. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 290-293 (1918). Bibl. footnotes.

See also ALKALINE EARTHS (Mellor), NITRIC ACID (Cottrell).

CALCIUM OXIDE

EPHRAIM, FRITZ. Calciumoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 202-205 (1909). References through text.

See also ALKALINE EARTHS (Mellor); LIME.

CALCIUM PHOSPHATES

BASSETT, HENRY, JR. Beiträge zum Studium der Calciumphosphate. *Z. anorg. Chem.* 59: 1-55 (1908). Bibl. footnotes.

BRAUNS, R. Ueber den Apatit aus dem Laacher Seegebiet, Sulfatapatit und Carbonatapatit. *Neues Jahrb. Mineral. Geol.* 41: 60-92 (1916-1917). Bibl. footnotes.

CALCIUM PHOSPHATES—Cont'd

EPHRAIM, FRITZ. Calcium und Phosphor. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 286-307 (1909). References through text.

PENROSE, R. A. F. Nature and origin of deposits of phosphate of lime. U. S. Geol. Sur., Bull. No. 46, 1888. Bibl., p. 129-140.

ROBINSON, C. S. The use of solutions of ammonium citrate for the estimation of reverted calcium phosphate. Mich. Agr. Expt. Sta., Bull. No. 46, 3-29 (1919). 54 references.

SEEBACH, M. Calciumphosphate. In Doelter, Handb. Mineralchem. 3, pt. 1: 323-352 (1918). Bibl. footnotes.

See also ALKALINE EARTHS (Mellor), FERTILIZERS, PHOSPHORITE.

CALCIUM SILICATE

DOELTER, C. Calciumsilicate. In his Handb. Mineralchem. 2, pt. 1: 445-500 (1914). Bibl. footnotes.

DOELTER, C. Calciummagnesiummetasilicate. In his Handb. Mineralchem. 2, pt. 1: 500-711 (1914). Bibl. footnotes.

GALKIN, XENIA. Chemische Untersuchungen einiger Hornblendens und Augite aus Basalten der Rhon. Neues Jahrb. Mineral. Geol. 29: 681-682 (1910). 21 references.

HIMMELBAUER, A. Calciumfluorohydrosilicate. In Doelter, Handb. Mineralchem. 2, pt. 1: 472-484 (1914). Bibl. footnotes.

JACOBY, R. Calciumsilikate. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 244-253 (1912). References through text.

See also CALCIUM ALUMINIUM SILICATE.

CALCIUM SODIUM CARBONATE. See GAYLUSSIT, PIRSSONIT.**CALCIUM SULFATE**

CAMERON, F. K., and BELL, J. M. Calcium sulfate in aqueous solution, a contribution to the study of alkali deposits. U. S. Dept. Agr., Bur. Soils, Bull. No. 33, 1906, 71 p. Bibl. footnotes.

EPHRAIM, FRITZ. Calciumsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 227-244 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCIUM SULFIDE

EPHRAIM, FRITZ. Calciummonosulfid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 217-221 (1909). References through text.

See also ALKALINE EARTHS (Mellor).

CALCULUS. See GALL STONES.**CALOMEL ELECTRODE.** See ELECTRODES.**CALORIMETRY**

"Calorimetry." Ind.-Cat. S. G. O., 2nd ser., 3: 94 (1898); 3rd ser., 3: 767-768 (1922). 87 references.

COX, ALVIN J. Calorimetry. Philipp. J. Sci. 4: 200-201 (1909).

DICKINSON, H. C. Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid and naphthalene. U. S. Bur. Standards, Bull. 11: 256-257 (1914); Sci. Paper No. 230. 41 selected references.

ESTREICHER, T. Ueber die Kalorimetrie der niedrigen Temperaturen. Sammlung chem. chem.-tech. Vorträge 20: 353-416 (1914). Bibl. footnotes.

CAMPHENE

BARTELT, K. Camphen. In Abderhalden, Biochem. Handl. 7: 332-344 (1912). 110 footnotes.

CAMPHOR

ASCHAN, OSSIAN. Ueber die Konstitution des Kampfers: Eine stereochemische Studie. Ann. 316: 196-241 (1900). 65 footnotes.

ASCHAN, OSSIAN. Die Konstitution des Kampfers und seiner wichtigsten Derivate. Braunschweig, Vieweg, 1903. 117 p. Bibl. footnotes.

BARTELT, K. Campher. In Abderhalden, Biochem. Handl. 7: 473-509 (1912). 300 footnotes.

BLANC, M. B. Le camphre. Bull. soc. chim. France (4) 5: i-xviii (1909). Bibl. footnotes.

BREDT, JULIUS, and PERKIN, WM. H., JR. Ueber Epicampher (β -Campher). J. prakt. Chem. 197: 209-257 (1913-1914). Bibl. footnotes.

"Camphor and derivatives." Ind.-Cat. S. G. O., 1st ser., 2: 659-661 (1881); 2nd ser., 3: 105-106 (1898); 3rd ser., 3: 774-776 (1922). Includes physiological effects, therapeutic uses, toxicology and synthetic product.

GIGLIOLI, I. La canfora Italiana. Reports of 6th Int. Congr. Appl. Chem., Rome, 1906, 4: 200-342. Bibl., classified.

HOUSEMAN, PERCY A. Camphor—natural and synthetic. Am. J. Pharm. 87: 49-59 (1915); Chem. Eng. 21: 81 (1915).

KAUSCH, OSKAR. Die Verfahren zur Herstellung von Kunstfer auf synthetischem Wege. Kunststoffe 4: 1-4, 24-25 (1914). Patents.

KLIMONT, I. M. Der technisch synthetische Campher. Leipzig, Spamer, 1921. 132 p. Bibl. footnotes.

MEYER, ANDRÉ. Le camphre synthétique son état actuel. Bull. soc. chim. 35: 12-16 (1924).

- MEYER-JACOBSON. Campher. *In their* Lehrb. org. Chem. 2, pt. 1: 1000-1029 (1902). Bibl. footnotes.
- PERROT, E., and GATIN, V. Le camphrier et ses produits. Min. Com. et Indus., Off. Natl. Matières Veg., Notice 4, 1920. 60 p. Bibl., p. 55-57.
- POND, F. J. Synthesis of camphor. *J. Soc. Chem. Ind.* 26: 383-386 (1907). 40 references.
- WERNER, A., and PFEIFFER, —. Fortschritte in der Chemie des Camphers bis Dezember, 1904. *Chem.-Z.* 4: 97, 124, 149 (1905). 59 footnotes.
- WITTE, E. Die Camphersynthese nach der Patentliteratur. *Chem.-Ztg.* 45: 118-121 (1921). 67 footnotes.
- WORDEN, E. C. Natural and synthetic camphor. *In his* Technology of cellulose esters 1: 2510-2517, 2520-2535 (1921). Bibl. footnotes.
- See also ESSENTIAL OILS.
- CAMPBOR SUBSTITUTES**
- WORDEN, E. C. Camphor substitutes. *In his* Technology of cellulose esters 1: 2535-2550 (1921). Bibl. footnotes.
- See also CELLULOID.
- CAMPHORIC ACID**
- MEYER-JACOBSON. *d*-Camphersäure. *In their* Lehrb. org. Chem. 2, pt. 1: 1014-1019 (1902). Bibl. footnotes.
- CAMPBORONIC ACID**
- MEYER-JACOBSON. Camphoronsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 456-457 (1913). 22 references.
- CANCER**
- "Cancer, chemistry of." *Ind.-Cat.* S. G. O., 3rd ser., 3: 788-789 (1922). 36 references.
- CANNING AND PRESERVING**
- BUTZ, G. C. Canning of fruits and vegetables. Pa. State Dept. Agr., Bull. No. 91, 1902. 58 p. Bibl., p. 46.
- CRUESS, W. V. Commercial fruit and vegetable products. New York, McGraw, 1924. 530 p. Bibl. at end of chapters.
- CRUESS, WM. V., and CHRISTIE, A. W. Laboratory manual of fruit and vegetable products. New York, McGraw, 1922. 109 p. Bibl., p. 107-109.
- ROUSSET, HENRI. Les confitures: technologie ménagère et industrielle des gelées, confitures, pâtes de fruits, compotes, sirops, miels, marmelades et fruits confits. 2nd ed. Paris, Desforges, 1922. 192 p. Bibl., p. 182-184.
- SAVAGE, WM. G. Canned food in relation to health. Cambridge, Univ. Press, 1923. 146 p. Bibl., p. 137-44.
- CANTHARIDIN**
- "Cantharides and cantharidin." *Ind.-Cat.* S. G. O., 1st ser., 2: 692-695 (1881); 2nd ser., 3: 148-149 (1898); 3rd ser., 3: 838-839 (1922).
- COFFEY, SAMUEL. The constitution of cantharidin. *Rec. trav. chim.* 42: 387-436 (1923). Bibl. footnotes.
- DOHRN, M., and THIELE, A. Cantharidin. *In* Abderhalden, Biochem. Handl. 1: 1344-1348 (1911). Bibl. footnotes.
- KNEIP, A., NEY, N., and REIMERS, F. Quantitative Bestimmung des Cantharidins in Cantharides und Cantharidentinktur. *Arch. Pharm.* 249: 259-285 (1911). Bibl. footnotes.
- CAOUTCHOUC.** See RUBBER.
- CAPILLARITY**
- "Capillarität." *In* Landolt-Börnstein, Tabellen, 4th ed., 1912, p. 132; 60 references. 5th ed., 1923, p. 245. 100 references.
- FREUNDLICH, HERBERT. Kapillarchemie. 3rd ed. Leipzig, Akad. Verlags., 1923. 1225 p. Bibl. footnotes.
- LOYD JOHN U. References to capillarity. *In* A study in pharmacy, 1895-1896. "Exhaustive bibl."
- LOYD, JOHN U. References to capillarity to the end of the year 1900. Collected and abstracted by Sigmund Waldbott. Lloyd Library of Botany, Pharm. Ser. No. 1; Bull. pharm. and materia medica ser., No. 4, 1902, p. 101-212.
- MACALLUM, ARCHIBALD B. Surface-tension and vital phenomena. Univ. Toronto Studies, Physiol. ser., No. 8, 1912. Bibl., p. 72-80. Reprinted from *Ergeb. Physiol.*, vol. 11.
- WALDEN, P., and SWINNE, R. Beiträge zur Kenntniss der Capillaritätskonstanten von flüssigen Estern. *Z. physik. Chem.* 79: 700-758 (1912). Bibl. footnotes.
- See also SURFACE TENSION.
- CAPROIC ACID**
- SCHMIDT, E. *n*-Capronsäure. *In* Abderhalden, Biochem. Handl. 1: 986-989 (1911). 60 footnotes. Includes derivatives.
- See also ACIDS, ORGANIC.
- CAPSICUM.** See OLEORESINS.
- CARBAMIC ACID**
- MELLOR, J. W. Carbamic acid. *In his* Inorg. theor. chem. 2: 792-797 (1922). 50 references.
- CARBAZOLE**
- MEYER-JACOBSON. Carbazol. *In their* Lehrb. org. Chem. 2, pt. 3: 335-344 (1915). Bibl. footnotes.
- CARBIDES**
- EHRlich, V., and MADER, R. Carbide. *In* Bräuer and d'Ans, Fortschritte 1: 2468-2470 (1922). German patents.
- GUTHIER, A. Metallkarbide. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 543-546 (1911). References through text.

CARBIDES—Cont'd

HÖNIGSCHMID, OTTO. *Karbide und Silizide*. Halle, Knapp, 1914. 263 p. Bibl. footnotes.

MATHEWS, J. A. Review and bibliography of the metallic carbides. *Smithsonian Misc. Coll.* 38, pt. 7 (Pub. No. 1090), 1898. 32 p.

MELLOR, J. W. The carbides. *In his Inorg. theor. chem.* 5: 844-904 (1924).

MEYER-JACOBSON. Metallderivate des Acetylens (Carbide). *In their Lehrb. org. Chem.* 1, pt. 1: 862-870 (1907). Bibl. footnotes.

See also ACETYLENE; names of individual carbides.

CARBOHYDRATES

ARMSTRONG, E. FRANKLAND. The simple carbohydrates and the glucosides. 4th ed. New York, Longmans, 1924. 293 p. Bibl., p. 245-284.

BRIDEL, MARC. La synthèse biochimique des hexobioses. *Bull. soc. chim. biol.* 4: 329-354 (1922). Bibl. footnotes.

"Carbohydrates." *Ind.-Cat. S. G. O.*, 1st ser., 2: 700 (1881); 2nd ser., 3: 158 (1898); 3rd ser., 3: 844-846 (1922).

CHEMICAL SOCIETY. Carbohydrates. *In Annual Reports on the progress of chemistry*, v. 1+. 1904 to date. Bibl. footnotes. Reprinted in part, since 1916, in *Intern. Sugar J.*

HEPBURN, JOSEPH S. Recent progress in the chemistry of the sugars. *J. Franklin Inst.* 170: 85-116 (1910). 88 references.

KARRER, P. Der Aufbau der polymeren Kohlenhydrate. *Ergeb. Physiol.* 20: 433-476 (1922). Bibl. footnotes.

LINDHARDT, KURT. Stickstoffhaltige Kohlenhydrate. *In Oppenheimer, Handb. Biochem.*, 2nd ed., 1: 542-554 (1924). 62 footnotes.

LIPPMANN, EDMUND O. v. Die Chemie der Zuckerarten. 3rd ed. Braunschweig, Vieweg, 1904. 2 parts. 2003 p. Bibl. through text.

MEYER-JACOBSON. Kohlenhydrate. *In their Lehrb. org. Chem.* 1, pt. 2: 906-1067 (1913). Bibl. footnotes.

NEF, J. U. Dissociationsvorgänge in der Zuckergruppe. I. Ueber das Verhalten der Zuckerarten gegen die Fehling'sche Lösung sowie gegen anderer Oxydationsmittel. *Ann.* 357: 214-312 (1907). 68 footnotes.

NEUBERG, C. Kohlenhydrate. *In Oppenheimer, Handb. Biochem.* 1: 159-225 (1909); 233 references. 2nd ed., 1: 477-541 (1924). 321 references.

NEUBERG, C., and REWALD, BRUNO. Die einfachen Zuckerarten. *In Abderhalden, Biochem. Handl.* 2: 265-526

(1911); 8: 96-279 (1914). Many hundred footnotes.

PRINGSHEIM, HANS. Die Polysaccharide. 2nd ed. Berlin, Springer, 1923. 234 p. 553 footnotes.

PRINGSHEIM, HANS. Pflanzliche höhere Kohlenhydrate. *In Oppenheimer, Handb. Biochem.*, 2nd ed., 1: 961-990 (1923). 178 references on cellulose, starch, glycogen and inulin.

"Sugar." *Ind.-Cat. S. G. O.*, 1st ser., 13: 859-862 (1892); 2nd ser., 17: 12-19 (1912).

TOLLENS, B. *Kurze Handbuch der Kohlenhydrate*. Breslau, 1888. Bibl., p. 231-260.

WERNER, A. Fortschritte in der Chemie der Zucker. *Chem.-Z.* 2: 493-495, 525-527, 595-597, 633-635 (1903). 196 footnotes.

ZEMPLÉN, GÉZA. Die einfachen Zuckerarten. *In Abderhalden, Biochem. Handl.* 10: 357-720 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Kohlenhydrate. Arbeiten allgemeinen Inhalts. *In Abderhalden, Biochem. Handl.* 10: 213-219 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Kohlenhydrate der Inulingruppe. *In Abderhalden, Biochem. Handl.* 10: 275-282 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Stickstoffhaltige Kohlenhydrate. *In Abderhalden, Biochem. Handl.* 10: 721-742 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Die wichtigsten physikalischen, physikalisch-chemischen und chemischen Eigenschaften der Kohlenhydrate und Glykosiden. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 919-972 (1922). Bibl. footnotes.

ZEMPLÉN, GÉZA. Kohlenhydrate—Synthetische Methoden. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 465-753 (1922). Bibl. footnotes.

See also SUGAR and names of individual carbohydrates, *e. g.*, GLUCOSE, FRUCTOSE, MANNOSE, XYLOSE, ETC.

CARBOHYDRATES: Acetyl derivatives.

HUDSON, C. S. The acetyl derivatives of the sugars. *J. Ind. Eng. Chem.* 8: 380-382 (1916). 40 footnotes.

CARBOHYDRATES: Analytical.

BEYERSDORFER, P. [The Ost copper carbonate solution and its suitability for the determination of invert sugar in the products of the sugar industry.] *Z. Ver. deut. Zuckerindus.* 1919, No. 765, 11: 403-443. Bibl.

BROWNE, CHARLES A. A handbook of sugar analysis: a practical and descriptive treatise for use in research, technical and control laboratories.

- New York, Wiley, 1912. Bibl., p. vii-ix.
- BRYAN, A. H. Analyses of sugar beets, 1905-1910, together with methods of sugar determinations. U. S. Dept. Agr., Bur. Chem., Bull. No. 146. 1911. 48 p. Chronological bibl.
- DAVIS, WM. A. The use of enzymes and special yeasts in carbohydrate analysis. *J. Soc. Chem. Ind.* 35: 201-209 (1916). Bibl. footnotes.
- DEHN, WM. M., and HARTMAN, FRANK A. Picrate colorimetric method for the estimation of carbohydrates. *J. Am. Chem. Soc.* 36: 403 (1914). 40 references.
- HAAR, O. W. VAN DER. Nachweis, zur Trennung und Bestimmung der reinen und aus Glukosiden usw. erhaltenen Monosaccharide und Aldehydsäuren. Berlin, Borntraeger, 1920. 345 p. Bibl. footnotes.
- LEWIS, R. C., and BENEDICT, S. R. Method for the estimation of sugar in small quantities of blood. *J. Biol. Chem.* 20: 61-72 (1915). 45 footnotes.
- QUISUMBING, F. A., and THOMAS, A. W. Conditions affecting the quantitative determination of reducing sugars by Fehling solution. *J. Am. Chem. Soc.* 43: 1503-1527 (1921). 45 footnotes.
- "Saccharometer." *Ind.-Cat. S. G. O.*, 2nd ser., 15: 5 (1910).
- WIECHMANN, FERDINAND G. Sugar analysis. New York, Wiley, 1893. Bibl., p. 110-112.
- ZEMPLÉN, GÉZA. Kohlenhydrate—Allgemeine und spezielle Methoden zu ihrem Nachweis. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 1-353 (1922). Bibl. footnotes.
- CARBOHYDRATES: Hydrolysis.**
- CALDWELL, ROBERT J. The hydrolysis of sugars. *Rept. Brit. Assoc. Adv. Sci.* 1906: 289-292. Chronological.
- CARBOHYDRATES: Metabolism.**
- ALBERTONI, PIETRO. Verhalten und Wirkung des Zuckers im Organismus. *Ergeb. Physiol.* 14: 432-439 (1914). 196 references.
- CZAPEK, R. Die Saccharide im Stoffwechsel der Pflanzen. In *his Biochemie der Pflanzen*, 3rd ed., 1: 240-708 (1922). Bibl. footnotes.
- GREENWALD, ISIDOR. Disturbances of carbohydrate metabolism, other than in diabetes mellitus. In *Barker, Endocrinology and metabolism*, 4: 289-307; references, 5: 511-694 (1922).
- MAGNUS-LEVY, A. Stoffwechsel der Kohlehydrate ausser Glykose. In *Oppenheimer, Handb. Biochem.* 4, pt. 1: 369-412 (1911). 278 footnotes.
- MAGNUS-LEVY, A. Die Kohlenhydrate im Stoffwechsel. Kohlenhydratestoffwechsel im Allgemeinen. Traubenzucker. In *Oppenheimer, Handb. Biochem.* 4, pt. 1: 307-368 (1911). 384 footnotes. 2nd ed. 8: 338-421 (1924). 978 footnotes.
- NEUBERG, CARL. Der Zuckerumsatz der Zelle. In *Oppenheimer, Handb. Biochem., Ergänzungsband*, 1913: 569-609. 145 footnotes.
- RINGER, A. I., and BAUMANN, EMIL J. The carbohydrates and their metabolism. In *Barker, Endocrinology and metabolism*, 3: 213-272; references, 5: 345-509 (1922).
- SHAFFER, PHILIP A. Intermediary metabolism of carbohydrates. *Physiol. Rev.* 3: 394-437 (1923). 202 references.
- CARBOHYDRATES: Mutarotation.**
- HUDSON, C. S. Review of the discoveries on the mutarotation of the sugars. *J. Am. Chem. Soc.* 32: 889-894 (1910). 40 references.
- CARBON**
- CAVEN, R. M. Carbon and its compounds. In *Friend, Textbook* 5: 23-175 (1917). Bibl. footnotes.
- GUTHIER, A. Kohlenstoff. In *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 472-543 (1911). References through text.
- MELLOR, J. W. Carbon. In *his Inorg. theor. chem.* 5: 710-978 (1924). Bibl. through chapter.
- MOISSAN, H. Carbone. In *his Chim. min.* 2: 187-262 (1905). 507 footnotes.
- NIGGERMANN, HERMANN. Die bisherigen Ergebnisse der Einwirkung chemischer Agenzien auf Kohle und Kohlenstoff. *Chem.-Ztg.* 41: 337, 354, 374 (1917); *Ges. Abh. Kennt. Kohle* 1: 1-21 (1917). 79 footnotes.
- THIELE, ALBRECHT. Kohlenstoff. In *Abderhalden, Biochem. Handl.* 1: 1-7 (1911). About 150 references.
- THORNE, P. C. L. Kolloide Lösungen von Kohlenstoff im Wasser. *Kolloid-Z.* 31: 119-132 (1922). 71 footnotes.
- WEIGERT, —. Kohlenstoff. In *Abegg, Handb. anorg. Chem.* 3, pt. 2: 253-276 (1909). 1307 references.
- CARBON: Adsorbent.** See CHARCOAL.
- CARBON: Analytical.**
- GUTHIER, A. Nachweis und Bestimmung des Kohlenstoffs. In *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 538-543, 886 (1911).
- CARBON BLACK**
- NEAL, R. O., and PERROTT, G. St. J. Carbon black, its manufacture, properties and uses. U. S. Bur. Mines,

CARBON BLACK—Cont'd

Bull. No. 192, 1922. 95 p. Bibl., p. 80-91.

See also CARBON (Mellor); LAMP-BLACK.

CARBON DIOXIDE

AUERBACH, E. B. Kohlensäure. In Bräuer and d'Ans, Fortschritte, 1: 2382-2384 (1922). German patents. "Dioxide of carbon." Ind.-Cat. S. G. O., 3rd ser., 3: 847-850 (1922). Includes estimation, physiology, poisoning by and therapeutic uses.

"Carbonic acid." Ind.-Cat. S. G. O., 1st/ser., 1: 78-80 (1880); 2nd ser., 1: 109-110 (1896).

GUTHIER, A. Kohlendioxyd, CO₂. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 586-694 (1911). References through text.

HÉBERT, A. Anhydride carbonique. In Moissan, Chim. min. 2: 283-300 (1905). 185 footnotes.

LETTS, E. A., and BLAKE, R. F. The carbonic anhydride of the atmosphere. Sci. Proc. Royal Dublin Soc., N. S., 9: 232-278 (1900).

LOEWY, A. Kohlensäure. In Heffter, Handb. exp. Pharmakologie, 1: 73-121 (1923). Bibl. footnotes.

THIELE, ALBRECHT. Kohlendioxyd. In Abderhalden, Biochem. Handl. 1: 1092-1107 (1911). 400 footnotes.

WIEGERT, —. Kohlendioxyd. In Abegg, Hand. anorg. Chem. 3, pt. 2: 253-276 (1909). 260 references.

CARBON DIOXIDE: Analytical.

GUTHIER, A. Nachweis und Bestimmung des Kohlendioxyd, der Carbonate und Perkarbonate. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 687-694, 898-899 (1911).

JOHNSTON, JOHN. Determination of carbonic acid, combined and free, in solution, particularly in natural waters. J. Am. Chem. Soc. 38: 948-975 (1916). Bibl. footnotes.

CARBON DISULFIDE

HÉBERT, A. Bisulfure de carbone. In Moissan, Chim. min. 2: 307-317 (1905). 244 footnotes.

MEYER-JACOBSON. Schwefelkohlenstoff. In their Lehrb. org. Chem. 1, pt. 2: 1356-1361 (1913). Bibl. footnotes.

RASSOW, B., and HOFFMANN, K. Ueber die Bildung von Schwefelkohlenstoff bei der Einwirkung von Schwefeldioxyd auf Kohle. J. prakt. Chem. 104: 207-240 (1922). Bibl. footnotes.

RICHTER, GEO. A. Manufacture of carbon disulfide. Trans. Am. Electrochem. Soc. 42: 252-266 (1922). References to specific heat and heat of formation.

See also CARBON (Weigert).

CARBON ELECTRODES. See ELECTRODES.**CARBON MONOXIDE**

BOCK, J. Das Kohlenoxyd. In Heffter, Handb. exp. Pharmakologie, 1: 1-72 (1923). Bibl. footnotes.

"Carbon monoxide." Ind.-Cat. S. G. O., 2nd ser., 3: 160-162 (1898); 3rd ser., 3: 850-853 (1922). Includes poisoning by CO.

GUTHIER, A. Kohlenoxyd, CO. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 549-586 (1911). References through text.

HÉBERT, A. Oxyde de carbone. In Moissan, Chim. min. 2: 275-283 (1905). 140 footnotes.

MELLOR, J. W. Carbon monoxide. In his Inorg. theor. chem. 5: 907-949 (1924).

THIELE, ALBRECHT. Kohlenoxyd. In Abderhalden, Biochem. Handl. 1: 1107-1114 (1911). 175 footnotes.

See also CARBON (Weigert).

CARBON MONOXIDE: Analytical.

GUTHIER, A. Nachweis und Bestimmung des Kohlenoxyds. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 585-587, 891-892 (1911).

CARBON SUBOXIDE

DONATH, ED., and BURIAN, OTTO. Die Kohlensuboxyde. In Sammlung chem. chem.-tech. Vorträge 27: 469-486 (1924). Bibl. footnotes.

MELLOR, J. W. Carbon suboxide. In his Inorg. theor. chem. 5: 904-907 (1924).

CARBON TETRACHLORIDE

BAUM, FRITZ. Tetrachlorkohlenstoff. In Abderhalden, Biochem. Handl. 1: 36-40 (1911). 105 footnotes.

HÉBERT, A. Tétrachlorure de carbone. In Moissan, Chim. min. 2: 263-266 (1905). 65 footnotes.

MARGOSCHES, B. M. Der Tetrachlorkohlenstoff. Sammlung chem. chem.-tech. Vorträge 10: 243-258 (1905). Bibl. footnotes.

MARGOSCHES, B. M. Der Tetrachlorkohlenstoff, unter besonderer Berücksichtigung seiner Verwendung als Lösungs- bzw. Extraktionsmittel in der Industrie der Fette und verwandter Gebiete. Stuttgart, Enke, 1905. 115 p.

MEYER-JACOBSON, Tetrachlorkohlenstoff. In their Lehrb. org. Chem. 1, pt. 2: 19-23 (1913). Bibl. footnotes.

CARBONIC ACID. See CARBON DIOXIDE.**CARBONIZATION. See CHARCOAL;**

COAL, CARBONIZATION.

CARBONYL CHLORIDE. See PHOSGENE.**CARBONYL SULFIDE**

MELLOR, J. W. Carbonyl sulfide. In his Inorg. theor. chem. 5: 971-978 (1924).

CARBONYLS

MELLOR, J. W. The metal carbonyls. *In his Inorg. theor. chem.* 5: 961-962 (1924).

CARBORUNDUM. See ABRASIVES.

CARMINIC ACID

SAMUELY, FRANZ. Carminsäure. *In Abderhalden, Biochem. Handl.* 6: 325-332 (1911). 32 footnotes.

CARNALLITE

EPHRAIM, FRITZ. Kaliummagnesiumchlorid (Carnalit). *In Gmelin-Kraut, Handb. anorg. Chem.* 2, pt. 2: 481-483 (1909). References through text.

CARNAUBON. See CEREBROSIDES.

CARNOSINE

BAUMANN, L., and INGVALDSEN, T. Histidine and carnosine. The synthesis of carnosine. *J. Biol. Chem.* 35: 263 (1918). 25 references.

CARO'S ACID. See PERMONOSULFURIC ACID.

CAROTIN

ESCHER, HEINRICH H. Zur Kenntniss des Carotins und des Lycopins. Promotionsarbeit, Tech. Hochschule, Zürich, 1909. 102 p. Bibl. footnotes.

PALMER, LEROY S., and ECKLES, C. H. Carotin, the principal natural coloring pigment of milk fat. I-IV. *Missouri Agr. Expt. Sta., Research Bull.* No. 9: 313-336; No. 10: 339-387; No. 11: 391-411; No. 12: 415-450 (1914). Also PALMER, Thesis, Univ. Missouri, 1915. Bibl. at end of each part.

PALMER, LEROY S. Carotinoids and related pigments; the chromolipoids. New York, Chem. Cat. Co., 1922. 316 p. Bibl., p. 279-295.

See also PLANT PIGMENTS.

CARVACROL

EINBECK, H. Carvacrol. *In Abderhalden, Biochem. Handl.* 1: 580-584 (1911). 85 footnotes.

CARVONE

BARTELT, K. Carvon. *In Abderhalden, Biochem. Handl.* 7: 459-470 (1912). 90 footnotes.

MEYER-JACOBSON. Carvon. *In their Lehrb. org. Chem.* 2, pt. 1: 938-944 (1902). Bibl. footnotes.

CASCARA

JOHNSON, C. W., and HINDMAN, EDITH. *Rhamnus purshiana*. Am. J. Pharm. 86: 405-413 (1914). Chronological.

CASE HARDENING

CARNEGIE LIBRARY OF PITTSBURGH. Case hardening. *In its Monthly Bull.* 23: 128-136 (1918).

GIOLITTI, F. Case hardening of steel. Intern. Eng. Congr., Metallurgy, 87-88 (1915). 18 references.

WHITE, A. H., and HOOD, H. T. Gas as a case hardening agent. Michigan Gas Assoc., 24th annual meeting, 1915. 32 p. Am. Gas Lighting J. 103: 266 (1915). 30 references.

CASEIN

"Caseine." Ind.-Cat. S. G. O., 1st ser., 2: 733 (1881); 2nd ser., 3: 195-196 (1898); 3rd ser., 3: 873-874 (1922). About 140 references.

DUNN, MAX S., and LEWIS, HOWARD B. Action of nitrous acid on casein. *J. Biol. Chem.* 49: 327 (1921). 34 references.

HEMMING, EMILE. Casein products. *In his Plastics*, 1923, p. 113-116. Patents only.

MAROTTA, DOMENICO. [Casein and its technical applications.] *Ann. chim. appl.* 6: 165-176 (1916).

OSBORNE, T. B., and GUEST, H. H. Hydrolysis of casein. *J. Biol. Chem.* 9: 333-353 (1911). Bibl. footnotes.

SAMUELY, FRANZ. Casein. *In Abderhalden, Biochem. Handl.* 4: 103-118 (1910); 9: 20-23 (1915). 250 footnotes.

U. S. Forest Products Laboratory. Bibliography on casein and casein glues. Technical Note F-6, 1919. *Chem. Met. Eng.* 21: 138 (1919). National Adv. Com. for Aeronautics, Rept. No. 66: 15 (1920). 37 references.

U. S. Library of Congress. Division of bibliography. List of references on casein. 1923. 7 p., mimeographed. 67 references.

See also GLUES; LACTOSE (Beltzer).

CASSIUS' PURPLE

VANINO, L. Cassius' Goldpurpur. Gewöhnliches Goldpurpur. *In Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 2: 254-260 (1914).

CATALASE

BATTELLI, F., and STERN, L. Die Katalase. *Ergeb. Physiol.* 10: 531-538 (1919). 195 references.

BECKING, L. G. M. B., and HAMPTON, H. C. Measurement of the catalytic power of catalase. *Am. J. Botany* 7: 261-274 (1920). 25 footnotes.

BEGEMANN, OTTO H. K. Beiträge zur Kenntniss pflanzlicher Oxydationsfermente. *Arch. ges. Physiol.* 161: 226-232 (1915). 115 references. Chronological.

"Blood, catalyse in." Ind.-Cat. S. G. O., 3rd ser., 3: 9 (1922).

"Catalase." Ind.-Cat. S. G. O., 3rd ser., 3: 883-884 (1922). 70 references.

CATALASE—Cont'd

DUTCHER, R. ADAMS. Catalase activity of tissues in avian polyneuritis. *J. Biol. Chem.* 36: 63 (1918). 38 references.

FRÉDERICKSZ, WLADIMIR. Rôle physiologique de la catalase. *Bul. soc. bot. Geneve* (2) 3: 112-115 (1911). 92 references.

NORGAARD, AXEL V. S. Om luftvolumetrisk katalasebestemmelse i filtrater fra fordøjelseskanalet indhold hos voksne. Thesis, Copenhagen, 1919. 286 p. Bibl., p. 277-286.

ZUNZ, EDGARD. Katalase. In *Abderhalden, Biochem. Handl.* 5: 646-650 (1911). 90 footnotes.

CATALYSIS

ABEL, E. Katalyse. *Z. Elektrochem.* 19: 933-951 (1913).

ACREE, S. F. [Mechanism of organic reactions.] See a series of papers in *Am. Chem. J.* vols. 27 to 48 (1902-1912).

ACREE, S. F. Catalytic reactions induced by enzymes. *J. Am. Chem. Soc.* 30: 1755-1760 (1908). Bibl. footnotes.

BANCROFT, WILDER D. Contact catalysis. *Trans. Am. Electrochem. Soc.* 37: 21-53 (1920). 93 footnotes.

BANCROFT, WILDER D. First report of the Committee on contact catalysis. *J. Ind. Eng. Chem.* 14: 326, 444, 545, 642 (1922). Reprint and Circular Series, Nat. Research Council, No. 30. 43 p. About 120 footnotes.

BANCROFT, WILDER D. The poisoning of catalytic agents. *Trans. Am. Electrochem. Soc.* 32: 439-464 (1917). 56 footnotes.

BANCROFT, WILDER D. Theory of contact catalysis. *Trans. Am. Electrochem. Soc.* 32: 475-494 (1917). 45 footnotes.

BARY, PAUL. Réactions catalytiques obtenues par le platine et les métaux de son groupe. In *his* Les colloïdes métalliques, 1920, p. 87-93.

"Catalysis." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 885-886 (1922).

CZAPEK, F. Katalyse. In *his* Biochemie der Pflanzen, 3rd ed., 1: 84-95 (1922). Bibl. footnotes.

EFFRONT, JEAN. Les catalyseurs biochimiques dans la vie et dans l'industrie. Paris, Dunod, 1914. 772 p. Translation, 1917, 752 p. Bibl. at ends of chapters.

FAJANS, KASIMIR. Ueber die stereochemische Spezifität der Katalysatoren (Optische Aktivierung durch asymmetrische Katalyse). *Z. physik. Chem.* 73: 25-96 (1910). Dissertation. Heidelberg, 1910. Bibl. footnotes.

FALK, K. GEORGE. Catalytic action. New York, Chem. Cat. Co., 1922. 172 p. Bibl. footnotes.

HALEN, S. Edelmetalle und Verbindungen der seltenen Erden als Kontaktstoffe. *Edel-Erden u. Erze* 1: 51, 76, 89, 102, 111 (1920). Largely patents through text.

HUFF, WILBERT J. The thermal problem in organic contact catalysis. *Trans. Am. Electrochem. Soc.* 36: 183-186 (1919). 20 references.

MEERWEIN, HANS. Katalyse. In *Houben, Methoden der organischen Chemie* 2: 388-475 (1922). Bibl. footnotes.

PRINS, H. J. Zur Kenntniss der katalytischen Wirkung. Synthese einiger Chlorpropane und ihrer Derivate. *J. prakt. Chem.* 197: 415-451 (1913-1914). Bibl. footnotes.

REID, E. E. Organic catalysis. *J. Ind. Eng. Chem.* 14: 838-839 (1922). 38 references.

RIDEAL, ERIC K. Catalysis in theory and practice. London, Macmillan, 1919. 496 p. Bibl. footnotes.

ROSENMUND, K. W. Katalyse. *Fortschritte Chem.* 15: 41-52 (1919-1920). References through text.

SABATIER, PAUL. Catalysis in organic chemistry. New York, Van Nostrand, 1922. 406 p. Bibl. footnotes.

STERBA, JOHANN ST. Bericht ueber die chemische Wirkung der Kathodenstrahlen. *Jahrb. Radioakt. Elektronik* 4: 306-307 (1908). 44 references.

STERN, E. Katalyse. *Fortschritte Chem.* 1: 28, 65, 316 (1909); 3: 25-33 (1910-11); 4: 15-23 (1911); 8: 249-254 (1913). References through text.

WARBURG, E. Ueber chemische Reaktionen, welche durch die stille Entladung in gasförmigen Körpern herbeigeführt werden. *Jahrb. Radioakt. Elektronik* 6: 181-184 (1909). 55 titles.

WOKER, GERTRUD. Die Katalyse. Die Rolle der Katalyse in der analytischen Chemie. I. Allgemeiner Teil. 2. pt. 1. [Inorganic catalysts.] Stuttgart, Enke, 1910, 1915. 645 and 803 p. Numerous bibl. footnotes.

WOKER, GERTRUD. Die Katalyse. II. Spezieller Teil. Zweite Abteilung. Biologische Katalysatoren. I Hälfte. Hydrolysierende Fermente. Stuttgart, Enke, 1924. 583 p. Bibl. footnotes. Author index.

See also ELECTRONICS.

CATAPHORESIS

BURTON, E. F. Cataphoresis. The motion of colloidal particles in an electric field. Fourth Report on colloid

chemistry, 1922, p. 23-32. 27 references.

See also COLLOIDS.

CATECHOL

NIERENSTEIN, M. Catechin. In Abderhalden, Biochem. Handl. 7: 3-6 (1912). 50 footnotes.

CELITE. See DIATOMACEOUS EARTH.

CELLOBIOSE

MEYER-JACOBSON. Cellobiose. In their Lehrb. org. Chem. 1, pt. 2: 1010 (1913). Bibl. footnotes.

ZEMPLÉN, GÉZA. Cellobiose. In Abderhalden, Biochem. Handl. 10: 598-600 (1923). Bibl. footnotes.

CELLS

"Cell, chemistry of." Ind.-Cat. S. G. O., 2nd ser., 3: 278 (1898); 3rd ser., 3: 935-936 (1922). 100 references.

"Cell, effects of chemical and physical agents on." Ind.-Cat. S. G. O., 3rd ser., 3: 939-940 (1922). 42 references.

HÖBER, RUDOLF. Physikalische Chemie der Zelle und der Gewebe. 5th ed. Leipzig, Engelmann, 1922. Part 1, 544 p. Bibl. footnotes. (4th ed., 1914, 808 p.)

KÖNIG, J., and RUMP, E. Chemie und Struktur der Pflanzen-Zellmembranen. Z. Nahr.-Genussm. 28: 177-222 (1914). Bibl. footnotes.

SPIRO, KARL. Physikalische Chemie der Zelle. In Oppenheimer, Handb. Biochem. 2: 1-78 (1908). 151 footnotes.

CELLS: Standard. See STANDARD CELLS.

CELLULOID

ANDES, LOUIS E. Ueber Neuerungen auf dem Gebiete der Celluloid Fabrikation. Chem.-Ztg. 26: 475-477 (1902); 27: 218-220 (1903). 76 footnotes.

HALEN, S. Verfahren zur Herstellung von Zelluloid oder zelluloidartigen Massen. Kunststoffe 4: 329-332 (1914). Patents.

MAIN, W. Le celluloid et ses succédanés. Paris, Gauthier, 1913, 163 p.

SACHS, ALBERT P., and BYRON, OSCAR. Camphor substitutes in the manufacture of celluloid. J. Ind. Eng. Chem. 13: 897-901 (1921). 213 patents.

SCHALL, M. Die Herstellung von Zelluloidlacken. Kunststoffe 1: 201-204 (1911); 6: 113-115 (1916). Patents.

SCHMIDT, —. Neuerungen auf dem Gebiete der Herstellung von Zelluloid und Zelluloidersatzstoffen. Kunststoffe 14: 129-133 (1924). Patents through text.

STOKES, H. N., and WEBER, H. C. P. Effects of heat on celluloid and similar materials. U. S. Bur. Standards,

Tech. Paper No. 98, 1917. Bibl., p. 40. 16 references.

See also LACQUERS; PYROXYLIN.

CELLULOSE

"Cellulose." Ind.-Cat. S. G. O., 1st ser., 2: 803 (1881); 2nd ser., 3: 284 (1898); 3rd ser., 3: 946-947 (1922).

CLIFFORD, PERCY H., and FARGHER, ROBERT G. Oxycellulose: its formation and reactions. A summary of the literature. J. Text. Inst. 13: 189-204 (1922); Am. Dyestuff Rep. 11: 405, 427 (1922). 90 references.

COLLINS, GEORGE E. The swelling of cotton cellulose. Shirley Inst. Mem. 2: 213-216 (1923); J. Text. Inst. 14: 264-276T (1923); Am. Dyestuff Rep. 12: 669-677 (1923). 200 references.

CRANE, JASPER E. Cellulose industries. In Roger, Manual of Industrial Chemistry, 3rd ed., 1067-1069. 75 selected references.

CZAPEK, F. Die Zellhautgerüst der Phanerogamen: Die Cellulose. In his Biochemie der Pflanzen, 3rd ed., I: 645-665 (1922). Bibl. footnotes.

DÖRR, E. [The present position of cellulose research.] Z. angew. Chem. 36: 399-402 (1923). Bibl. footnotes.

HÄGGLUND, ERIK. Die Hydrolyse des Zellstoffs und des Holzes. Sammlung chem. chem.-tech. Vorträge 22: 454-456 (1916).

HALLE, —. [Paper and cellulose masses.] Kunststoffe 6: 269-273, 289-292 (1916). Patents.

HESS, KURT, WELTZIEN, W., and MESSMER, E. Ueber Cellulose. Ann. 435: 1-144 (1923). Bibl. footnotes.

HIBBERT, HAROLD. Chemistry of cellulose. I. Constitution of cellulose. J. Ind. Eng. Chem. 13: 256-260, 334-342 (1921). Bibl. footnotes.

SANDER, A. Chemie und Industrie der Cellulose. Fortschritte Chem. 4: 293-307 (1911). References through text.

SCHWALBE, CARL G. Die Chemie der Cellulose. Berlin, Borntraeger, 1911. 665 p. Bibl. footnotes.

WORDEN, EDWIN C. Technology of cellulose esters. Vol. 1 in 5 parts. New York, Van Nostrand, 1921. p. 1-388 have 13,665 references (including patents) on cellulose.

ZEMPLÉN, GÉZA. Cellulosen. In Abderhalden, Biochem. Handl. 2: 198-233 (1911); 8: 49-80 (1914); 10: 283-328 (1923). Bibl. footnotes.

Serial

Cellulosechemie. Wissenschaftliche Beilblätter zu der Zeitschrift "Der Papierfabrikant." Berlin, Elsner. Not sold separately. 1920-. Abstracts

CELLULOSE—Cont'd

are given of the important articles on the chemistry of cellulose, lignin and related compounds.

See also COTTON, FIBERS, PAPER.

CELLULOSE: Action of bacteria.

ALEXABDROWICZ, JERZY S. Zur Kenntnis des Cellulose und des celluloselösenden Fermentes im Hepatopankreassaft der Schnecke (*Helix pomatia*). Arch. ges. Physiol. 150: 57-86 (1913). Bibl. footnotes.

DASZEWSKA, WANDA. Etude sur la désagregation de la cellulose dans la terre de bruyere et la tourbe. Bull. soc. bot. Genève (2) 4: 315-316 (1912). 49 references.

MCBETH, I. G. Decomposition of cellulose in soils. Soil Science 1: 481-487 (1916). 99 references.

MCBETH, I. G., and SCALES, F. M. The destruction of cellulose by bacteria and filamentous fungi. U. S. Dept. Agr., Bur. Plant Ind., Bull. 266, 1913. 52 p. Bibl., p. 47-50.

CELLULOSE: Analytical.

RENKER, MAX. Ueber Bestimmungsmethoden der Cellulose. Z. angew. Chem. 23: 193-198 (1910). 34 footnotes.

VANDEVELDE, A. J. J. Sur le residu insoluble cellulosique. Bull. soc. chim. Belg. 29: 258-284 (1920). 140 footnotes.

WEST, C. J. Recent literature on the determination of cellulose. Paper Trade J. 72, No. 17: 50-54 (Apr. 21, 1921).

CELLULOSE: Digestion.

LOHRISCH, HANS. Über die Bedeutung der Cellulose im Haushalte des Menschen. Z. physiol. Chem. 47: 248-252 (1906). 85 references.

LOHRISCH, H. Über der Verdauung und Verwertung der Rohfaser und Zellulose im tierischem und menschlichem Organismus. Z. ges. Physiol. Path. Stoffwechsels, n. s., 2: 820-822 (1907). 54 references.

LOHRISCH, H. Der Vorgang der Cellulose- und Hemicelluloseverdauung beim Menschen und der Nährwert dieser Substanzen für den menschlichen Organismus. Z. exp. Path. Ther. 5: 535-539 (1909). 104 references.

CELLULOSE ACETATE

COCHRANE, J. R. S. Airplane dopes. I. Materials, plant and process for production of cellulose acetate. Commonwealth Australia Munitions Supply Board, Tech. Repts., 1920-1921, 20.

DRINKER, PHILIP. European practice in cellulose acetate and dopes during

the war. J. Ind. Eng. Chem. 13: 835-836 (1921). 38 footnotes.

CLÉMENT, L., and RIVIÈRE, C. Azetylcellulosen. Kunststoffe 4: 148-152, 166-168, 186-188 (1914). Patents.

EICHENGROEN, A. Acetylcellulosen. In Ullmann, Enzykl. tech. Chem. 1: 114-130 (1914). Patents through text. Bibl., p. 130.

FISCHER, E. J. Zelluloseacetate und andere organische Säureester der Zellulose. Kunststoffe 2: 48-52, 64-69 (1912); 4: 102-105, 123-126 (1914). Patents.

SCHWALBE, CARL G. S. Die Acetylierung der Baumwollcellulose. Z. angew. Chem. 23: 433-441 (1910). 48 footnotes.

WORDEN, EDWARD C. Carbohydrate carboxylates. New York, Van Nostrand, 1916. 575 p. Bibl. footnotes.

WORDEN, EDWARD C. Cellulose acetate. J. Soc. Chem. Ind. 38: 374T (1919). About 100 references and patents.

WORDEN, EDWARD C. Cellulose acetate. In his Technology of cellulose esters 1: 2987-3014 (1921). Bibl. footnotes.

See also CELLULOSE ESTERS.

CELLULOSE ESTERS

SPROXTON, FOSTER. Cellulose esters. In Third report on colloid chemistry, 1920, p. 89-90.

WORDEN, EDWARD C. Cellulose esters. In his Technology of cellulose esters 1: 2377-3083 (1921). 28,316 references, including patents. Solvents for esters are discussed on p. 2382-2510.

CELLULOSE FORMATE

WORDEN, E. C. Formylated cellulose. J. Soc. Chem. Ind. 31: 1064-1068 (1912); Kunststoffe 2: 325-328 (1912). 334 references in 65 footnotes.

WORDEN, E. C. Cellulose formate. In his Technology of cellulose esters 1: 3015-3018 (1921). Bibl. footnotes.

See also CELLULOSE ESTERS.

CELLULOSE NITRATE

LIPSCHITZ, ADOLF. Beiträge zur Kenntnis der Einwirkung der Salpetersäure auf Baumwollcellulose. Zürich, Leeman, 1913. 66 p. Bibl. footnotes.

WORDEN, EDWARD C. Analysis of cellulose nitrates. In his Technology of cellulose esters, 1: 2273-2381 (1921). 1216 references.

WORDEN, EDWARD C. Nitration of cotton. In his Technology of cellulose esters, 1: 1933-2271 (1921). 1014 references.

WORDEN, EDWARD C. Nitrocellulose industry. 2 vol. New York, Van Nostrand, 1911. 8000 references.

CELLULOSE XANTHATE. See VISCOS.

CELTUM. See HAFNIUM.

CEMENT

ABRAMS, DUFF A. Effect of storage on cement. Structural materials research laboratory, Lewis Inst., Bull. 6, 1924. 2nd ed. 38 p. Bibl., p. 35-38.

ARLT, FERDINAND R. v. Allgemeines ueber Zemente. In Doelter, Hand. Mineralchem. 1: 851-854 (1912). 106 references to books.

ATWOOD, WM. G., and JOHNSON, A. A. Disintegration of cement in sea water. Proc. Am. Soc. Civil Eng. 49: 1058-1064 (1923). 114 references. Also in their Marine structures, 1924, p. 496-519.

BATES, P. H., PHILLIPS, A. J., and WIG, R. J. Action of the salts in alkali waters and sea water on cements. U. S. Bur. Standards, Tech. Paper No. 12, 1912. 157 p. Bibl., p. 103-105. 100 references.

BURCHARTZ, R. F. [The use of trass for cement and as an addition to concrete.] Zement 12: 269-271 (1923).

CANDLOT, E. Ciments et chaux hydrauliques, fabrication—propriétés—emploi. 3rd ed. Paris. Béranger, 1906. 531 p. Bibl., p. 523-525.

COCHRAN, JEROME. A treatise on cement specifications. New York, Van Nostrand, 1912. 101 p. Bibl., p. 82-94.

DITTLER, E. Die Silicate und Aluminate des Zements. In Doelter, Handb. Mineralchem. 1: 804-814 (1912). Bibl. footnotes.

ECKEL, EDWARD C. Cements, limes and plasters; their materials, manufacture and properties. 2nd ed. New York, Wiley, 1922. 655 p. References at ends of chapters.

ECKEL, C. E. Portland cement materials and industry in the United States. U. S. Geol. Sur., Bull. No. 522. Bibl., p. 375-381. 125 references, 1888-1912.

ENDELL, K. Wichtigste Literatur ueber Zementforschung seit 1908. Z. angew. Chem. 31: 240 (1918). 59 references.

GOVERNMENT and state publications on cement materials, cement and concrete. U. S. Geol. Sur., Mineral Resources, 1916, pt. 2: 371-375. 138 references, 1888-1917.

HALEN, S. Im Gewerbe, in der Industrie und im Haushalt verwendbare Kitten. Kunststoffe 2: 321-325, 368-371 (1912). Patents.

HEMMING, EMILE. Calcareous cements and artificial stones. In his Plastics, 1923, 42-90. Patents.

HURSCH, R. K. Cements, limes and plasters. J. Ind. Eng. Chem. 13: 477-478 (1921).

KALLAUNER, O. [Portland cement and magnesium salts.] Tonind.-Ztg. 36: 1335-1336.

KLEIN, A. A., and PHILLIPS, A. J. Hydration of Portland cement. U. S. Bur. Standards, Tech. Paper No. 43, 1914. 71 p. 60 footnotes.

PLATZMANN, C. R. [Progress of cement research.] Zement 12: 73-76, 79-82 (1923).

PORTLAND CEMENT ASSOCIATION. Library. Catalog of books, periodicals and pamphlets in the library of the Portland cement association. Chicago, 1918. 59 p.

WITT, J. C. Effect of electrolytes on cement, as reported by a number of investigators. Philipp. J. Sci. 13: 30-34 (1918). 60 references.

See also SOIL ALKALIES.

CEMENTS: Dental.

VOELKER, CHAS. C. Dental silicate cements in theory and practice. Dental Cosmos 58: 1110-1111 (1916). 40 references.

CEMENTS: Magnesia.

ROARK, R. J. Physical properties of magnesia cements and magnesium cement compounds. Wisconsin Univ., Eng. Expt. Sta., Bull. 8, No. 5: 247-332. Bibl., p. 326-327. 25 references.

WEST, G. H., SEBASTIAN, R. L., and DARROW, W. A. Bibliography of magnesian cements. U. S. Bur. Mines, Repts. of Investigations, No. 2534. Oct., 1923. 17 p., mimeographed. 211 references, classified.

CEPHALIN

"Cephalin." Ind.-Cat. S. G. O., 3rd ser., 3: 951 (1922). 25 references.

See also LIPOIDS.

CERAMICS

BOLLENBACH, H. Die Fortschritte der Feinkeramik. Chem.-Ztg. 35: 653-654 (1911); 43 footnotes. 37: 1129-1130, 1183-1185 (1913). 61 footnotes.

BRANNER, JOHN C. A bibliography of clays and the ceramic arts. Am. Ceramic Soc., 1906. 451 p. 6027 references. "An alphabetical arrangement, supposed to cover the art from early times to the year 1906." Revision of U. S. Geol. Sur., Bull. No. 143, 1896.

FENAROLI, PIERO. Progressi nella chimica e tecnologia delle arti ceramiche nei 1913. Ann. chim. appl. 2: 374-390 (1914). 95 footnotes.

FUNK, W. Fortschritte der Keramik. Chem.-Ztg. 47: 673, 701, 718, 734, 742 (1923). 174 footnotes.

CERAMICS—Cont'd

- GEYER, L. E. Revised list of publications on ceramic investigations, Bureau of Mines. U. S. Bureau of Mines, Repts. of Investigations, No. 2645. 1924. 7 p., mimeographed. 90 titles. First list issued as Report 2437, 1923.
- GT. BRIT. Patent office. Subject list of works on the silicate industries (ceramics and glass) in the library of the Patent Office. London, Patent Office, 1914. 77 p.
- Reference list of ceramic books. *J. Am. Ceram. Soc.* 6: 322-348 (1923). Classified.
- RIECKE, R. Neuere Fortschritte auf dem Gebiete der keramischen Chemie. *Fortschritte chem.* 6: 141-156, 185-200 (1912-1913). References through text.
- SOLON, LOUIS M. E. Ceramic literature: an analytical index to the works published in all languages on the history and technology of the ceramic art. London, Griffin, 1910. 660 p.
- SOLON, M. L. List of books on the history and technology of the ceramic art. *Trans. English Ceram. Soc.* 11: 65-104 (1911-1912). Supplements the above book.
- SOCIETY OF CHEMICAL INDUSTRY. Ceramics and building materials. *In* Reports of the progress of applied chemistry, 1: 133-149 (1916); 84 references. 2: 204-241 (1917); 131 footnotes. 4: 189-201 (1919); 54 references. 5: 215-228 (1920); 84 footnotes. 6: 228-256 (1921); 101 footnotes. 7: 197-215 (1922); 78 footnotes. 8: 218-232 (1923); 39 footnotes. 9: 278-303 (1924); 95 footnotes.
- TRENTON, N. J. Free Public Library. List of books on ceramics. Trenton, 1906. 30 p.
- WASHBURN, E. W., PARMALEE, C. W., and HURSH, R. K. Selected list of books in the English language dealing with ceramics. *Dept. Ceramic Eng., Univ. Ill., Bull.* No. 42, 1921. *J. Ind. Eng. Chem.* 13: 476-478 (1921).
- VOGT, G. Ceramique. *In* Moissan, *Chim. min.* 4: 61-112 (1905). 107 footnotes.

Serial

Ceramic abstracts. Easton, Pa., Am. Ceramic Soc. 1922-. (Abstracts were included in the Journal of the Am. Ceramic Soc. without separate paging in vol. 2, no. 6-vol. 4 (June, 1919 to Dec., 1921). Covers: Abrasives; cement, lime and plasters; enamels; glass; heavy clay products;

refractories; terra cotta; whiteware; apparatus and equipment; kilns, furnaces, fuels and combustion; geology; chemistry; physics; general. Includes patents.

Silikat-Zeitschrift. *Archiv für Wissenschaft und Technik der Silikate und keramisches Zentralblatt.* 1913-. References classified under headings: Silicate investigations; methods; firing technique; raw materials; glass; enamels; heavy clay products; lime and cement; miscellaneous.

See also ABRASIVES, BRICK, CLAY, GLASS, REFRACTORIES, ETC.

CEREBROSIDES

"Cerebrin and cerebroside." *Ind.-Cat. S. G. O.*, 2nd ser., 3: 305 (1898); 3rd ser., 3: 973 (1922). 23 references.

CRAMER, W., and FUCHS, D. Protagon, Cerebroside und verwandte Substanzen. *In* Abderhalden, *Biochem. Handl.* 3: 250-267 (1911); 8: 469-472 (1914). 115 footnotes.

POSNER, EDWARD R., and GIES, WM. J. Is protagon a mechanical mixture of substances or a definite chemical compound. *J. Biol. Chem.* 1: 59-112 (1905). 35 references.

"Protagon." *Ind.-Cat. S. G. O.*, 1st ser., 11: 713 (1890); 2nd ser., 13: 899 (1908). 24 references.

SCHULZ, FR. N. Cerebroside. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 1: 991-997 (1924). 31 references.

THIERFELDER, H. Cerebroside. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 6: 145-168 (1922). *Bibl. footnotes.*

See also BRAIN, LIPIDS.

CEREBRO-SPINAL FLUID

BLUMENTHAL, FERDINAND. Ueber Cerebrospinalflüssigkeit. *Ergeb. Physiol.* 1: 285-286 (1902). 42 references.

"Cerebrospinal fluid, chemistry of the." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 974-975 (1922). 40 references.

SCHUMM, O. Methoden zur Untersuchungen des Liquor cerebrospinalis. Einige spezielle chemische Methoden. *In* Abderhalden, *Handb. biol. Arbeitsm.* 5, pt. 5 B: 25-72 (1923). *Bibl. footnotes.*

CERESIN. *See* HYDROCARBONS; PETROLEUM (Redwood).

CERIUM

HIRSCH, ALCAN. Metallic cerium, its preparation and properties, with special reference to its commercial applications. *Trans. Am. Electrochem. Soc.* 20: 101-102 (1911); *J. Soc. Chem. Ind.* 31: 477 (1922). 61 references.

- BONARDI, J. P. Selected bibliography on the qualitative and quantitative chemistry of cerium and thorium. *In* U. S. Bur. Mines, Bull. No. 212, 1923, p. 66-70. 105 references.
- LITTLE, H. F. V. Cerium. *In* Friend, Textbook, 4: 376-404 (1917). Bibl. footnotes.
- MAGEE, W. H. Indexes to the literature of cerium (1751-1894) and lanthanum (1839-1894). Smithsonian Misc. Coll., No. 971, 1895. 43 p. Cerium, p. 5-31. 500 references. Chronological with author index.
- MELLOR, J. W. Cerium family of rare earths. *In his* Inorg. theor. chem. 5: 586-676 (1924). Bibl. through chapter.
- WOLFF, HERMANN. Ueber einige Salze des Ceriums. *Z. anorg. Chem.*, 45: 89-115 (1905). Bibl. footnotes.
- See also RARE EARTHS.
- CERUSSITE.** See LEAD CARBONATE.
- CESIUM**
- CHABRIÉ, C. Cesium. *In* Moissan, Chim. min. 3: 1-11 (1904). 78 footnotes.
- EPHRAIM, FRITZ. Cäsium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 215-233 (1906). References through text.
- WALKER, A. J. Cesium. *In* Friend, Textbook, 2: 200-210 (1924). Bibl. footnotes.
- See also ALKALI METALS.
- CETYL ALCOHOL**
- ALEXRAD, SOL. A wool fat (lanolin) substitute and the preparation of cetyl alcohol. *J. Ind. Eng. Chem.* 9: 1123-1125 (1917).
- See also ALCOHOLS.
- CHABASITE**
- GOLDSCHLAG, M. Chabasit. *In* Doelter, Handb. Mineralchem. 2, pt. 3: 73-129 (1921). Bibl. footnotes.
- See also ZEOLITES.
- CHALCEDONY**
- LEITMEIER, H. Chalcedon ($\text{SiO}_2 \cdot x\text{H}_2\text{O}$). *In* Doelter, Handb. Mineralchem. 2, pt. 1: 165-185 (1914). Bibl. footnotes.
- See also QUARTZ.
- CHARCOAL**
- BANCROFT, WILDER D. Charcoal before the war. *J. Phys. Chem.* 24: 127-146, 201-224, 342-366 (1920). Bibl. footnotes.
- HALEN, J. Die Herstellung aktiver Kohlen. *Kunststoffe* 9: 23-27 (1919). 36 patents.
- LIESGANG, RAPHAEL ED. Kohle für Adsorptionszwecke, 1914-1919. *Chem.-Ztg.* 44: 89-90 (1920). 44 footnotes.
- McKEE, R. H., and HORTON, P. M. Adsorbent carbons for many industries. *Chem. Met. Eng.* 32: 16 (1925). 23 patents and 22 journal references.
- RAY, ARTHUR B. Activated carbon. *Chem. Met. Eng.* 29: 354-359 (1923). 44 references. *Trans. Am. Inst. Chem. Eng.* 15, pt. 1: 345-346 (1924). 33 references.
- See also ADSORPTION, CARBON.
- CHAULMOOGRA OIL**
- READ, BERNARD E. The toxicity of chaulmoogra oil (*Oleum hydnocarp*). *J. Pharmacol.* 24: 257-258 (1924). 39 references.
- WARREN, L. E. Chemistry and therapeutic properties of chaulmoogra oil. *J. Am. Pharm. Assoc.* 10: 510-521 (1921). 39 references.
- CHEESE**
- "Cheese." *Ind.-Cat. S. G. O.*, 1st ser., 2: 867 (1881); 2nd ser., 3: 359-360 (1898); 3rd ser., 3: 1010-1013 (1922). Includes bacteriology and chemistry.
- ELLBRECHT, G. Ost und Osteoproduktion. Copenhagen, 1911. 264 p.
- FISK, W. W. Study of some factors influencing the yield and the moisture content of Cheddar cheese. *N. Y. Cornell Agr. Expt. Sta., Bull.* No. 334: 515-538 (1913).
- FISK, W. W. Methods of making some of the soft cheeses. *N. Y. Cornell Agr. Expt. Sta., Circ.* No. 30: 41-62 (1915). 28 references.
- HARRISON, F. C. The ripening of cheese and the rôle of microorganisms in the process. *Trans. Canadian Inst.* 7, 1: 103-134 (1901).
- HART, E. B. Relation of the action of certain bacteria to the ripening of cheese of the Cheddar type. *J. Agr. Res.* 2: 214-216 (1914). 32 references.
- HUCKER, G. J. The bacteriological aspects of cheese ripening. *Abst. Bact.* 5: 287-303 (1921). 242 references. Also in *N. Y. Agr. Expt. Sta., Tech. Bull.* No. 89, 1922. 36 p.
- HUPPERT, OTTO. Beiträge zur Kenntniss der Stickstoffverbindungen des Magerkäses. Promotionsarbeit, Tech. Hochschule, Zürich, 1920. 51 p. Bibl. footnotes.
- REUCHLIN, E., and RACHEL, F. Beiträge zur Käseuntersuchungen. *Z. Nahr.- Genussm.* 26: 20-38 (1913). 46 references.
- THOM, C. Camembert cheese problems in the U. S. Conn. Storrs Agr. Expt. Sta. Bull. No. 58: 317-374. U. S. Dept. Agr., Bur. Animal Ind., Bull. No. 115, 1909. 54 p.

CHEESE—Cont'd

THOM, CHARLES, and FISK, WALTER W. The book of cheese. New York, Macmillan, 1918. 392 p. Contains bibls.

VAN SLYKE, L. L., and PUBLOW, C. A. The science and practice of cheese making. New York, Orange Judd, 1909. 483 p. Bibl., p. 454-462. 109 references to Expt. Sta. Repts., with subject index, 463-471.

WITTE, GUSTAV A. Die Heiztechnischen Einrichtungen der Käseerei. Bern, Wyss, 1911. 688 p. Bibl., p. 577-594.

See also DAIRY PRODUCTS, MILK.

CHEMICAL APPARATUS

Die Entwicklung des Apparatewesens auf dem Gebiete der anorganisch-chemischen Grossindustrie während des Weltkrieges. Chem.-Ztg. 43: 273, 293, 313, 330, 349 (1919). 299 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Plant and machinery. In Annual reports on the progress of applied chemistry, 3: 7-17 (1918); 37 footnotes. 4: 7-19 (1919); 30 footnotes. 5: 5-17 (1920); 38 footnotes. 6: 5-10 (1921); 27 footnotes. 7: 5-12 (1922); 31 footnotes. 8: 5-11 (1923); 28 footnotes.

See also LABORATORY APPARATUS, PLATINUM.

CHEMICAL EDUCATION

MARION, G. E. Bibliography on the training and education of the chemist and chemical engineer. J. Ind. Eng. Chem. 7: 269 (1915). About 75 references.

CHEMICAL EQUILIBRIUM

BRUYN, B. R. Beitrag zur Kenntniss der Gleichgewichte mit zwei flüssigen Phasen in Systemen von einem Alkalisalz, Wasser und Alkohol. Z. physikal. Chem. 34: 62-115 (1900). 75 footnotes.

"Equilibres chimiques." In Tables Annuelles, 1: 436-445 (1910); 2: 495-503 (1911); 3: 350-356 (1912); 4: 850-880 (1913-1916).

"Gleichgewichte je zwei organischer Stoffe." In Landolt-Börnstein, Tabellen, 5th ed., 1923, 704-706 (1923). 165 references.

HERZ, WALTER G. Chemische Verwandtschaftslehre: die Lehre von den Gleichgewichten in homogenen und heterogenen Systemen und von der Reaktionsgeschwindigkeit. Sammlung chem.-chem.-tech. Vorträge 8: 349-408 (1903). Bibl. footnotes.

KREMANN, R. Chemische Gleichgewichtslehre. Fortschritte Chem. 13:

177-188 (1917-1918); 15: 23-39 (1919-20); 17: 1-22, 65-80, 113-134 (1921-23). References through text.

MELLOR, J. W. Effect of temperature on chemical equilibria. In his Inorg. theor. chem. 1: 732-739 (1922). 50 references.

CHEMICAL KINETICS

ABEL, E. Kinetik der Wasserstoff-superoxyd-Jod-Reaktion. Z. physik. Chem. 96: 1-197 (1920). Bibl. footnotes.

BREDIG, G. Die Elemente der chemischen Kinetik, mit besonderer Berücksichtigung der Katalyse und der Fermentwirkung. Ergeb. Physiol. 1: 134-212 (1902). Bibl. footnotes.

FREUNDLICH, H., and KRESTOVNIKOFF, A. Ueber die Kinetik der Umwandlung von Chloralkylaminen in heterozyklisch Verbindungen. Z. physikal. Chem. 76: 79-104 (1911); 79: 681-699 (1912). Bibl. footnotes.

KREMANN, R. Chemische Dynamik und Kinetik. Fortschritte Chem. 1: 161-172, 236-250 (1909); 2: 93-106 (1910); 3: 35-51, 321-337 (1910-11); 4: 161-175 (1911); 5: 115-129 (1912); 6: 105-124 (1912-13); 7: 97-112 (1913); 8: 85-106 (1913); 9: 151-175 (1914); 10: 161-182 (1914-15); 11: 133-146 (1915-16). References through text.

KREMANN, R. Chemische Geschwindigkeitslehre. Fortschritte Chem. 13: 1-6 (1917-1918); 15: 131-137 (1919-20); 17: 23-32, 81-83 (1920).

MELLOR, J. W. Chemical statics and dynamics, including the theories of chemical changes, catalysis and explosions. New York, Longmans, 1909. 528 p. Bibl. footnotes.

RICE, FRANCIS O. Reaction velocity in homogeneous systems. In Taylor, Treatise on physical chemistry 2: 865-931 (1924). Bibl. footnotes.

TAYLOR, HUGH S. Reaction velocity in heterogeneous systems. In his Treatise on physical chemistry 2: 933-1004 (1924). Bibl. footnotes.

"Vitesse de réaction." In Tables Annuelles 1: 445-459 (1910); 2: 504-516 (1911); 3: 357-374 (1912); 4: 881-930 (1913-16).

WARDER, ROBERT B. Literature of the speed of chemical reactions. Proc. Am. Assoc. Adv. Sci., 32, 156-158 (1884).

CHEMICAL PATHOLOGY

WELLS, H. GIDEON. Chemical pathology—discussion of general pathology from the standpoint of the chemical processes involved. 4th ed. Philadelphia, Saunders, 1920. Bibl. footnotes.

CHEMICAL WARFARE

BEROLZHEIMER, D. D. Gases used in warfare: references to the standard reference books. *J. Ind. Eng. Chem.* 11: 256 (1919). 80 references.

HAFERKORN, HENRY E., and NEUMANN, FELIX. Poisonous gas in warfare: application, prevention, defense and medical treatment. *Prof. Mem., Corps of Engineers*, 9: No. 48 (1917); reprinted in 1918. 42 p. 267 references, annotated.

WEST, CLARENCE J. Chemical warfare. *Special Libraries* 10: 225-236 (1919). A. D. Little, Inc., Bibl. Series No. 1, 1919. 12 p. About 550 references.

See also names of gases, such as PHOSGENE.

CHEMOTHERAPY

"Chemotherapy." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 1035-1036 (1922). 75 references.

DALE, H. H. Chemotherapy. *Physiol. Rev.* 3: 390-393 (1923).

FORNEAU, E. État actuel de la chimiothérapie. *Bull. soc. chim.* (4) 37: 23-30 (1925). References classified by compounds.

HARRISON, L. W. Critical review. The treatment of syphilis. *Quart. J. Med.* 10: 291-360 (1917). 150 references.

See also ARSENIC, ORGANIC COMPOUNDS; MERCURY, ORGANIC COMPOUNDS.

CHICLE

U. S. Library of Congress. List of references on chicle and chewing gum. 1922. 4 p. mimeographed.

CHINESE WOOD OIL. See TUNG OIL.**CHITIN**

VIEHÖVER, ARNO. Detection of molds in drugs, foods and spices. *J. Am. Pharm. Assoc.* 6: 518-524 (1917). 32 references.

WESTER, D. H. Studien ueber das Chitin. *Arch. Pharm.* 247: 305-307 (1909). 129 references.

ZEMPLÉN, GÉZA. Chitin. *In* Abderhalden, *Biochem. Handl.* 2: 527-536 (1911); 8: 280-281 (1914); 10: 721-723 (1923). Bibl. footnotes.

CHLORAL

"Chloral." *Ind.-Cat. S. G. O.*, 1st ser., 2: 962-968 (1882); 2nd ser., 3: 482-484 (1898); 3rd ser., 3: 1108-1109 (1922). Includes effects of, therapeutic use and toxicology.

MEYER-JACOBSON. Chloral. *In their Lehrb. org. Chem.* 1, pt. 2: 867-874 (1913). Bibl. footnotes.

See also SEDATIVES.

CHLORALOSE

"Chloralose." *Ind.-Cat. S. G. O.*, 2nd ser., 3: 485 (1898); 3rd ser., 3: 1109 (1922). 60 references.

CHLORAMINE

"Chloramine." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 1109 (1922). 17 references.

MONSANTO CHEMICAL WORKS. Use and properties of chloramine-T and associated chlorinated products. St. Louis, Monsanto, 1923. 23 p. Bibl., p. 20-23.

See also DAKIN'S SOLUTION.

CHLORANIL. See TETRACHLOROQUINONE.

CHLORATES

"Chlorate und perchlorate." *In* Ullmann, *Enzyk. tech. Chem.* 3: 442-454 (1916). References through text.

KNIBBS, N. V. S., and PALFREMAN, H. Theory of electrochemical chlorate and perchlorate formation. *Trans. Faraday Soc.* 16: 432-433 (1920). 41 references.

See also CHLORIC ACID.

CHLORETONE

"Chloretone." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 1109-1110 (1922). 30 references.

CHLORIC ACID

DITZ, HUGO. Chlorsäure, HClO_3 . *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 138-152 (1909). References through text.

MELLOR, J. W. Chloric acid. *In his Inorg. theor. chem.* 2: 296-370 (1922). Covers preparation, properties and salts.

CHLORINE

BRALLIER, P. S. A survey of products that afford industrial outlets for chlorine. *Chem. Met. Eng.* 30: 508, 542, 624 (1924). Bibl. footnotes.

"Chlorine." *Ind.-Cat. S. G. O.*, 1st ser., 2: 969 (1881); 2nd ser., 3: 485-486 (1898); 3rd ser., 3: 1111-1112 (1922).

DITZ, HUGO. Chlor. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 42-74 (1909). References through text.

DITZ, HUGO. Chlor. *In* Ullmann, *Enzyk. tech. Chem.* 3: 371-403 (1916). References through text.

GAUTIER, HENRI. Chlore. *In* Moissan, *Chim. min.* 1: 87-115 (1904). 141 footnotes.

JOLY, M. A. Chlore. *In* Frémy, *Enc. chim.* II, 1^{er} cahier: 562-564 (1885).

KÖTZ, A. Chlor. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 2: 202-213 (1912). 506 references.

MARTIN, G., and DANCaster, E. A. Chlorine. *In* Friend, *Textbook* 3: 51-140 (1915). Bibl. footnotes.

MELLOR, J. W. Chlorine. *In his Inorg. theor. chem.* 2: 15-126 (1922). Occurrence, 10 references; history, 25 references; preparation, 150 references; properties, 150 references; chemical properties, 35 references.

CHLORINE—Cont'd

RABE, R. Chlor. *In* Bräuer and d'Ans. Fortschritte 1: 150-151 (1921). German patents.

CHLORINE: Analytical.

DITZ, HUGO. Chlor—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 74, 115-117, 416, 420-421 (1909).

CHLORINE DIOXIDE

DITZ, HUGO. Chlordioxyd, Chlorperoxyd (ClO_2). *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 134-138 (1909).

MELLOR, J. W. Chlorine dioxide. *In* his *Inorg. theor. chem.* 2: 287-291 (1922). 50 references.

CHLORINE MONOXIDE

DITZ, HUGO. Chlormonoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 118-120 (1909).

MELLOR, J. W. Chlorine monoxide. *In* his *Inorg. theor. chem.* 2: 240-242 (1922). 20 references.

CHLOROACETIC ACID

MEYER-JACOBSON. Chloressigsäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 482-483, 494-495 (1913). Bibl. footnotes.

CHLOROCROTONIC ACID

MEYER-JACOBSON. Chlorcrotonsäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 515-518 (1913). 60 references.

CHLOROFORM

BASKERVILLE, CHARLES, and HAMOR, W. A. The chemistry of anesthetics. IV. Chloroform. *J. Ind. Eng. Chem.* 4: 212-220, 278-288, 362-372, 422-429, 499-506, 571-581 (1912). Bibl. footnotes.

BAUM, FRITZ. Chloroform. *In* Abderhalden, *Biochem. Handl.* 1: 30-36 (1911). 150 references.

"Chloroform." *Ind.-Cat. S. G. O.*, 1st ser., 2: 969-982 (1881); 2nd ser., 3: 487-497 (1898); 3rd ser., 3: 1112-1124 (1922).

MEYER-JACOBSON. Chloroform. *In* their *Lehrb. org. Chem.* 1, pt. 2: 11-16 (1913). Bibl. footnotes.

See also ANESTHETICS.

CHLOROPHYLL

"Chlorophyll." *Ind.-Cat. S. G. O.*, 2nd ser., 3: 498 (1898); 3rd ser., 3: 1126-1127 (1922).

CUSMANO, G. La clorofilla. *Ann. chim. appl.* 5: 97-117 (1916). Bibl. footnotes.

CZAPEK, F. Die Pigmente der Chloroplasten. *In* his *Biochemie der Pflanzen*, 3rd ed., 1: 55-585 (1922). Bibl. footnotes.

HUG, ERNST. Die Isolierung von reinem Chlorophyll. *Promotionsarbeit*, Tech. Hochschule, Zürich, 1911. 68 p. Bibl. footnotes.

MARCHLEWSKI, L. Die Chemie des Chlorophylls. Hamburg, 1895.

MARY, ALBERT. Études analytiques et synthétiques sur la chlorophylle. Paris, Maloine, 1917. 37 p. Bibl. footnotes.

MEYER, ERWIN W. Fortschritte auf dem Gebiete der Chlorophyllchemie. *Chem.-Ztg.* 35: 1341-1343, 1354-1356, 1364-1365 (1911). 44 footnotes.

RUTH, W. A. The effect of Bordeaux mixture upon the chlorophyll content of the primordial leaves of the common bean, *Phaseolus vulgaris* L. *Am. J. Bot.* 9: 535-550 (1922). 42 references.

SCHERTZ, FRANK M. Chemical and physiological study of mottling of leaves. Thesis, Univ. Chicago, 1918. *Bot. Gaz.* 71: 128-130 (1921). 53 references.

STOLL, ARTHUR. Ueber Chlorophyllase und die Chlorophyllide. *Promotionsarbeit*, Tech. Hochschule, Zürich, 1912. 101 p. Bibl. footnotes.

WEST, CLARENCE J. Review of Willstätter's researches on chlorophyll. *Biochem. Bull.* 3: 229-258 (1914). 45 footnotes.

WILLSTÄTTER, RICHARD. Ueber Pflanzenfarbstoffe. *Ber.* 47: 2831-2874 (1914); *J. Am. Chem. Soc.* 37: 323-345 (1915). Bibl. footnotes.

WILLSTÄTTER, RICHARD. Chlorophyll. *In* Abderhalden, *Biochem. Handl.* 6: 1-22 (1911). Bibl. footnotes.

WILLSTÄTTER, RICHARD, and STOLL, ARTHUR. Untersuchungen ueber Chlorophyll; Methoden und Ergebnisse. Berlin, Springer, 1913. 424 p. Bibl. footnotes.

CHLOROPLASTIC ACID

LOWENSTEIN, W. Platinchloridchlorwasserstoffe. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 3: 298-303 (1915). References through text.

See also PLATINUM.

CHLOROSUCCINIC ACID

MEYER-JACOBSON. Chlorbernsteinsäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 521 (1913). 36 references.

CHLOROSULFONIC ACID

DITZ, HUGO. Chlorsulfonsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 204-206 (1909). References through text.

CHOCOLATE. See CACAO.**CHOLESTEROL**

"Cholesterine." *Ind.-Cat. S. G. O.*, 1st ser., 3: 152 (1882); 2nd ser., 3: 608 (1898); 3rd ser., 3: 1157-1159 (1922).

CZAPEK, F. Die Sterinlipide der Pflanzen. *In* his *Biochemie der*

- Pflanzen, 3rd ed., 1: 784-802 (1922). Bibl. footnotes.
- DALMER, O. Cholesterin. *In* Abderhalden, Biochem. Handl. 10: 156-177 (1923). Bibl. footnotes. Includes derivatives.
- "Eye, cholesterol in." *Ind.-Cat. S. G. O.*, 1st ser., 4: 471-472 (1883); 2nd ser., 5: 265 (1900).
- GLIKIN, W. Ueber Cholesterine und verwandte Stoffe. *Biochem. Centr.* 7: 289-306, 357-377 (1908). 156 references.
- HEPBURN, JOSEPH S. Biochemical studies of cholesterol. *J. Franklin Inst.* 176: 405-452 (1913). Thesis, Columbia Univ., 1913, 56 p. 104 references.
- MARCUSSON, J. Die Sterine und ihre Bedeutung. *Chem.-Ztg.* 41: 577-580, 590-591 (1917). 43 footnotes.
- MEYER-JACOBSON. Sterine. *In their* *Lehrb. org. Chem.* 2, pt. 4: 181-232 (1924). Bibl. footnotes.
- STEINKOPF, WILHELM. Ueber die Kontaktzersetzung des Cholesterins. *J. prakt. Chem.* 208: 65-85 (1920). 37 footnotes.
- THAYSEN, THORVALD E. H. Bidrag til cholesterinets og cholesterinæthernes fysiologiske kemi. Thesis, Copenhagen, 1913. 149 p. Bibl., p. 141-149.
- WINDAUS, A. Abbau- und Aufbauversuche im Gebiete der Sterine. *In* Abderhalden, *Handb. biol. Arbeitsm.* I, pt. 6: 169-210 (1922). Bibl. footnotes.
- WINDAUS, A., and FODOR, A. Sterine. *In* Abderhalden, *Biochem. Handl.* 3: 268-309 (1911); 8: 473-493 (1914). About 450 footnotes.
- CHOLESTEROL: Analytical.**
- LUDEN, GEORGINE. Influence of bile derivatives in Bloor's cholesterol determination. *J. Biol. Chem.* 29: 463-476 (1917). 21 references.
- WESTON, PAUL G. Colorimetric methods for determining serum cholesterol. *J. Biol. Chem.* 28: 383 (1917). 11 references.
- CHOLESTEROL: Blood.**
- "Blood, cholesterol in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 11-12 (1922). 65 entries.
- DEWEY, KAETHE. Experimental hypercholesterolemia. *Arch. Int. Med.* 17: 757-785 (1916). 48 footnotes.
- GORHAM, F. D., and MEYER, V. C. Cholesterol content of human blood. *Arch. Int. Med.* 20: 599-612 (1917). 29 footnotes.
- LUDEN, GEORGINE. Changes in cholesterol content of blood. *J. Biol. Chem.* 27: 273-297 (1916). 28 references.
- LUDEN, GEORGINE. Relation of the diet, the blood cholesterol and the lymphoid defense. *J. Lab. Clin. Med.* 3: 141-174 (1917). 61 references.
- LUDEN, GEORGINE. Blood cholesterol in malignant diseases and the effect of radium on the blood cholesterol. *J. Lab. Clin. Med.* 4: 849-864 (1918). 72 references.
- MYERS, V. C. Chemical changes in the blood in disease. VI. Cholesterol. *J. Lab. Clin. Med.* 5: 776-783 (1919-1920).
- CHOLESTEROL: Pathology.**
- LUDEN, GEORGINE. Observations on cholesterol retention as a factor in cell proliferation. *J. Lab. Clin. Med.* 1: 662-676 (1916).
- NELSON, CHAS. H., and WHEELON, HOMER. Relation of cholesterol to the resistance of the red blood cells to the hemolytic action of sapotoxin. *J. Lab. Clin. Med.* 6: 563-578 (1921). 81 references.
- SMALL, J. C. The rôle of cholesterol in pathology. *J. Lab. Clin. Med.* 1: 809-815 (1916).
- CHOLIC ACID.** *See* BILE ACIDS.
- CHOLINE**
- "Choline." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 1160-1161 (1922).
- KINOSHITA, TOSAKU. Ueber den Cholingehalt tierischer Gewebe. *Arch. ges. Physiol.* 132: 607-631 (1910). Bibl. footnotes.
- MEYER-JACOBSON. Cholin. *In their* *Lehrb. org. Chem.* 1, pt. 2: 273-276 (1913). Bibl. footnotes.
- RONA, PETER. Cholin, Betain, Neurin, Muscarin, Trigonellin, Stachydrin. *In* Abderhalden, *Biochem. Handl.* 4: 828-839 (1911); 9: 211-226 (1915). About 300 footnotes.
- ZEMPLÉN, GÉZA. Cholin, Betain, Neurin, Muscarin, usw. *In* Abderhalden, *Biochem. Handl.* 11: 295-311 (1924). Bibl. footnotes.
- See also* AMINES; BASES, ORGANIC.
- CHRISTOBALITE**
- JACOBY, R. Christobalit. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 135-136 (1912). References through text.
- See also* QUARTZ, SILICA.
- CHROME REFRACTORIES.** *See* REFRACTORIES.
- CHROMIUM**
- DOLBEAR, SAMUEL H. Chromium. *Mineral Ind.* 25: 100-105 (1916); 26: 88-93 (1917); 27: 87-92 (1918); 28: 77-82 (1919); 29: 88-92 (1920). 60 references.
- GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the

CHROMIUM—Cont'd

British Empire and foreign countries. War period. Chrome ore and chromium. (1913-1919). 1920. 29 p. Bibl., p. 26-29.

HÉBERT, A. Chrome. *In* Moissan, *Chim. min.* 4: 595-684 (1905). 930 footnotes.

JANDER, G. Kolloide Chromverbindungen. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 1, 2nd half: 475 (1919). 20 references.

KOPPEL, I. Chrom. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 1, 2nd half: 438-467 (1919). 1408 references, 1798-1919.

MOISSAN, H. Le chrome et ses composés. *In* Frémy, *Enc. chim.* 3, 9^e cahier: p. 327-345 (1884). Chronological, then alphabetically by author.

STERN, DORA. Chrom. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 311-701, 1319-1394 (1912). References through text.

CHROMIUM AMMINES

KOPPEL, I. Chromiammine. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 1, 2nd half: 449-451 (1919). 70 references.

PFEIFFER, P. Chromiäke. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 489-490, 1361-1369 (1912).

PFEIFFER, P. Ueber Chromiäke. *Z. anorg. Chem.* 29: 107-137 (1902). 40 references on p. 111-112.

CHROMIUM: Analytical.

DEHN, WM. M. Colorimetric studies on the nature of chromate solutions. *J. Am. Chem. Soc.* 36: 829-847 (1914). Bibl. footnotes.

STERN, DORA. Chrom: Analytisches. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 336-341, 1326-1327 (1912).

TOWNSEND, A. S. Rapid methods for the determination of chromium in steels. *Forging and Heat Treating* 8: 304-305 (1922).

CHROMIUM CHLORIDES

BJERRUM, NIELS. Studien über Chromichlorid. *Z. physikal. Chem.* 59: 336-383, 581-604 (1907). 50 footnotes.

DARLING, ELTON R. Notes on the chemistry of chromyl chloride. *Chem. Met. Eng.* 26: 59 (1922).

STERN, DORA. Chromichlorid. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 424-440 (1912). References through text.

CHROMIUM ORES

RUMBOLD, W. G. Chromium ores. (Imperial Inst. Monograph). London, Murray, 1921. Bibl., p. 56-58. 51 references, 1908-1920.

CHROMIUM OXIDE

STERN, DORA. Chrom und Sauerstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 343-378 (1912). References through text.

CHROMIUM STEELS. See STEEL.**CHROMIUM SULFATE**

GRAHAM, MINNIE A. Study of the change from violet to green in solutions of chromium sulfate. *Am. Chem. J.* 48: 187-190 (1912). Chronological bibl., 1841-1908, of 50 references.

STERN, DORA. Chromisulfate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 401-414 (1912).

CHROMISOMERISM

DEHN, WM. M., and McBRIDE, LOIS. Chromoisomerism of methyl orange. *J. Am. Chem. Soc.* 39: 1348-1377 (1917). Bibl. footnotes.

CHROMONES

MEYER-JACOBSON. Chromon. *In their Lehrb. org. Chem.* 2, pt. 3: 729-733 (1916). Bibl. footnotes.

SIMONIS, H. Die Chromone. *Sammlung chem. chem.-tech. Vorträge* 24: 313-469 (1917). Bibl. footnotes.

CHRYSAROBIN

EDER, ROBERT. Ueber das Chrysarobin des Handels. *Arch. Pharm.* 253: 1-22 (1915). Bibl. footnotes.

CHRYSENE

BAUM, FRITZ. Chrysen. *In* Abderhalden, *Biochem. Handl.* 1: 362-365 (1911). 35 references.

CHYMASE

ZUNZ, EDGARD. Chymase. *In* Abderhalden, *Biochem. Handl.* 5: 618-625 (1911). 175 footnotes.

See also ENZYMES.

CICUTOXIN

JACOBSON, C. A. Water hemlock (Cicuta). *Nevada Agr. Expt. Sta., Tech. Bull.* 81: 7-46 (1915). 83 references.

CINCHONA

ACHNER, ADOLPH. Beiträge zur Kenntniss der flachen Cinarinden. Dissertation, Univ. Bern, 1904. 108 p. Bibl., p. 103-108.

"Chinchona and its alkaloids." *Ind.-Cat. S. G. O.*, 1st ser., 3: 186-191 (1882); 2nd ser., 3: 643-648 (1898); 3rd ser., 3: 1206-1208 (1922).

COMANDUCCI-NEAPEL, EZIO. Die Konstitution der Chinaalkaloide. *Sammlung chem. chem.-tech. Vorträge* 16: 141-306 (1911). Bibl. footnotes.

MARKHAM, CLEMENTS R. Peruvian bark. A popular account of the introduction of chinchona cultivation into British India. London, Murray, 1880. Bibl. of cinchona, p. 487-516.

See also ALKALOIDS.

CINEOL

MEYER-JACOBSON. Cineol. *In their* Lehrb. org. Chem. 2, pt. 1: 910 (1902).

CINNAMIC ACID

DOHRN, M., and THIELE, A. Zimtsäure. *In* Abderhalden, Biochem. Handl. 1: 1230-1232 (1911). 60 references.

MEYER-JACOBSON. Zimtsäure. *In their* Lehrb. org. Chem. 2 pt. 1: 604-615 (1902). Bibl. footnotes.

CINNAMIC ALDEHYDE

WITTE, W. Zimtaldehyde. *In* Abderhalden, Biochem. Handl. 1: 846-851 (1911). 95 footnotes.

See also ALDEHYDES.

CITRAL

BARTELT, K. Citral. *In* Abderhalden, Biochem. Handl. 7: 421-431 (1912). 90 footnotes.

MEYER-JACOBSON. Citral. *In their* Lehrb. org. Chem. 1, pt. 1: 1010 (1907). 50 references.

THIELE, ALBRECHT. Citral. *In* Abderhalden, Biochem. Handl. 1: 778-781 (1911). 60 footnotes.

CITRIC ACID

CAMP, ARTHUR F. Citric acid as a source of carbon for certain citric fruit destroying fungi. *Ann. Missouri Bot. Garden* 10: 294-298 (1923). 70 references.

HALLERBACH, WILHELM. Die Citronensäure und ihre Derivate. Berlin, Springer, 1911. 104 p. About 400 footnotes.

MEYER-JACOBSON. Citronensäure. *In their* Lehrb. org. Chem. 1, pt. 1: 1005 (1907).

THIELE, ALBRECHT. Citronensäure. *In* Abderhalden, Biochem. Handl. 1: 1174-1181 (1911). 190 footnotes.

CITRONELLAL

MEYER-JACOBSON. Citronellal. *In their* Lehrb. org. Chem. 1, pt. 1: 1005 (1907). 30 references.

THIELE, ALBRECHT. Citronellal. *In* Abderhalden, Biochem. Handl. 1: 781-783 (1911). 30 references.

CITRONELLOL

BARTELT, K. Citronellol. *In* Abderhalden, Biochem. Handl. 7: 363-365 (1912). 40 footnotes.

CITRUS FRUITS

COIT, J. E. Citrus fruits. New York, Macmillan, 1915. 520 p. Bibl. and references to other bibls.

SAN BERNARDINO, Free public library. Citrus fruits and their culture. The Library, 1913. 24 p.

ZOLLER, HARPER F. Some constituents of the American grape fruit. *J. Ind. Eng. Chem.* 10: 373-374 (1918). 42 references.

CLAY

ASHLEY, HARRISON E. The colloid matter of clay and its measurement. *U. S. Geol. Sur., Bull. No. 388*, 1909. 65 p. Bibl., p. 59-62; 87 references, covering 1854-1908.

BRADFIELD, RICHARD. The chemical nature of a colloidal clay. Thesis, Ohio State Univ., 1922. 60 p. Bibl., p. 58-60.

BRANNER, JOHN C. A bibliography of clay and the ceramic arts. *Am. Ceramic Soc.*, 1906. 451 p. 6027 references.

BUCKMAN, H. O. The chemical and physical processes involved in the formation of residual clays. *Trans. Am. Ceram. Soc.* 13: 364-384 (1921). 181 references, covering 1821-1910.

DAVIS, N. B. Plasticity of clay. *Trans. Am. Ceram. Soc.* 16: 65-79 (1914). 46 footnotes.

DAVIS, N. B. The plasticity of clay and its relation to mode of origin. *Bull. Am. Inst. Mining Eng.*, No. 98, 301-330 (1915). 88 footnotes.

HANCE, J. H. Note on the occurrence and use of fire clay. *U. S. Geol. Sur., Mineral Resources*, 1913, pt. 2: 645-647. 19 references.

HEATH, FRED T. Bibliography and abstracts on the utilization of pebbly clays for heavy clay products manufacture. *Bull. Am. Ceram. Soc.* 4: 165-188 (1925). 49 references with extensive abstracts.

LADD, G. E. A preliminary report on a part of the clays of Georgia. *Georgia Geol. Sur., Bull. No. 6A*, 1898. 204 p. Bibl., p. 193-199. 93 references.

LITTLE, H. E. V. Clay and ceramics. *In* Friend, Textbook, 4: 103-134 (1917). Bibl. footnotes.

MIDDLETON, J. Clay working industries. *U. S. Geol. Sur., Mineral Resources*, 1913, pt. 2: 635-637; 1914, pt. 2: 545-548. 58 references to government publications.

RIES, HEINRICH. Clays of New York: their properties and uses. *N. Y. State Museum, Bull. No. 35*, 1900. 944 p. Bibl., p. 908-912. 80 references.

RIES, H. Report on the clays of Maryland. *Md. Geol. Sur.*, 4: 488-493 (1902). 74 references.

RIES, H., BAYLEY, W. S. *et al.* High grade clays of the Eastern United States with notes on some Western clays. *U. S. Geol. Sur., Bull. No. 708*, 1922. 305 p. 145 footnotes.

RIES, H., and KUMMEL, H. B. The clays and clay industry of New Jersey. *N. J. Geol. Sur. Final Rept.*

CLAY—Cont'd

6, 1904. 548 p. Bibl., p. 513-518. 76 references.

RIES, H., and LEIGHTON, HENRY. History of the clay working industry in the United States. New York, 1909. 270 p. Bibl. p. 241-245. 172 references.

ROHLAND, P. Tone. In Abegg, Handb. anorg. Chem. 3, pt. 1: 118-119 (1906). 67 references.

SEARLE, A. B. Clay and clay products. In Third report on colloid chemistry, 1920, p. 153-154.

SEARLE, ALFRED B. The clayworker's handbook. A manual for all engaged in the manufacture of articles from clay. London, Griffith, 1921. Bibl., p. 344-354. 326 titles.

WHEELER, H. A. Clay deposits. Missouri Geol. Sur., 11. 622 p. Bibl., p. 603-610. 174 titles.

YEATES, W. S. Clay and its manufacture. Georgia Geol. Sur., Bull. No. 6A, 1898. Bibl., p. 193-199. 93 references.

See also CERAMICS, LATERITE, PAPER-MAKING, REFRACTORIES.

COAGULATION

FREUNDLICH, H. Zur Theorie der Koagulationsgeschwindigkeit. Kolloid-Z. 23: 163-173 (1918). 41 footnotes.

ODEN, SVEN. Fraktionierte Koagulation. Beziehungen Zwischen Teilchengrösse und Stabilität disperser Systeme. Z. physikal. Chem. 78: 682-707 (1912). Bibl. footnotes.

See also COLLOIDS.

COAL

AUDIBERT, E., and RAINEAU, A. [Modern theories of the chemical constitution of solid fuels.] Rev. ind. minerale, 1924: 127-172. 51 references.

BONE, WM. A. Coal and its scientific uses. London, Longman, 1918. 491 p. Bibl., p. 481-483. 54 references.

BROOKS, A. H. Alaska coal and its utilization. U. S. Geol. Sur., Bull. No. 442, 1910. Bibl., p. 95-100. 105 references.

DONATH, EDUARD, and LISSNER, A. Kohle und Erdöl. Sammlung chem. chem.-tech. Vorträge 26: 37-144 (1920). Bibl., p. 139-144.

FLORENTIN, DANIEL. [Recent progress in the chemistry of carbon and coal.] Bull. soc. chim. 31: 721-752 (1922). Bibl. footnotes.

GLAUD, W. Alteres Ergebnisse auf dem Gebiet der Kohlenextraktion. Ges. Abh. Kennt. Kohle 1: 43-53 (1917). Bibl. footnotes.

LEE, W. T., and NICKLES, J. M. Classified list of papers dealing with coal, coke, lignite and peat contained in the publications of U. S. Geol. Sur., except those on Alaska. U. S. Geol. Sur., Bull. No. 341: 419-436 (1909). 362 entries. Earlier list in Bull. No. 316: 518-532 (1907).

LEES, JAMES H. Bibliography of Iowa coals. Iowa Geol. Sur., 19: 659-687 (1909). 750 references.

McCLELLAND, E. H. Literature of the coal industry. Reprinted from the "Coal Industry" by the Library of the Carnegie Institute of Pittsburgh. "Classified list of the more important books, serials and trade publications during the year with a few of earlier date not previously announced." Appeared annually since 1921.

MOORE, EDWARD S. Coal, its properties, analysis, classification, geology, extraction, uses and distribution. New York, Wiley, 1922. 462 p. Bibl. footnotes.

NICKLES, J. M., and LEE, W. T. Classified list of papers dealing with coal, coke, lignite and peat contained in publication of U. S. Geol. Sur. U. S. Geol. Sur., Mineral Resources, 1910: 226-242; 1913, pt. 2: 926-928; 1914, pt. 2: 744-746. 508 titles.

PORTER, JOHN B. An investigation of the coals of Canada with reference to their economic qualities. Canada, Dept. Mines, Mines Br., Rept. No. 83, 1912-1915. 7 v. Bibl., 7: 184-188.

ROBERTSON, JOHN B. The chemistry of coal. London, Gurney, 1919, 96 p. Bibl., p. 92-94.

RONALDSON, JAMES H. Coal. (Imperial Inst. Monograph.) London, Murray, 1920. 166 p. Bibl., p. 160-166. 172 references.

STEVENSON, JOHN J. The formation of coal beds. Proc. Am. Phil. Soc. 50: 1-116 (1911). 111 footnotes.

STEVENSON, JOHN J. Interrelation of the fossil fuels. Proc. Am. Phil. Soc. 55, No. 2, 1916. 203 p. 265 footnotes.

STOPES, MARIE C., and WHEELER, R. V. Monograph on the constitution of coal. London, Dept. Sci. Ind. Res., 1918. 58 p. Bibl., p. 46-57. About 400 references.

STOPES, MARIE C., and WHEELER, R. V. Constitution of coal. Fuel in Science and Practice 3: 439-452 (1924). 542 references.

STRACHE, OTTO, and LANT, RICHARD. Kohlenchemie. Entstehung und chemisches Verhalten der Kohlen und ihrer Bestandteile. Leipzig,

- Akad. Verlags., 1924. 599 p. Bibl. footnotes.
- U. S. Library of Congress. List of bibliographies on coal. 1920. 11 p., mimeographed. 105 titles. Largely economic in character.
- U. S. Library of Congress. Select list of references on coal, 1904-1913. 1913. 14 p., mimeographed.
- WAGNER, FREDERICK H. Coal and coke. New York, McGraw, 1916. 431 p. Bibl., p. 417-418.
- WEITHOFER, K. A. Die historische Entwicklung der Ansichten ueber die Entstehung der Kohlen und Kohlenflöze. Neues Jahrb. Mineral. Geol. 41: 149-232 (1916-17). Bibl. footnotes, with author index.
- WHITE, DAVID. The effect of oxygen in coal. U. S. Geol. Surv. Bull. No. 382, 1909. 74 p. Bibl., p. 73-74.
- See also CARBON.
- COAL: Analytical.**
- FIELDNER, A. C., *et al.* Analysis of mine and car samples of coal collected in the fiscal years 1911-1913. U. S. Bureau of Mines, Bull. No. 85, 1914. 444 p. Bibl., p. 417-424. 146 references.
- FIELDNER, A. C., *et al.* Analysis of mine and car samples of coal collected in the fiscal years 1913-1916. U. S. Bur. Mines, Bull. No. 123, 1918. 478 p. Bibl., p. 440-453.
- FIELDNER, A. C., SELVIG, W. A., and PAUL, J. W. Analysis of mine and car samples of coal collected in the fiscal years 1916-1919. U. S. Bur. Mines, Bull. No. 193, 1922. 391 p. Bibl., p. 353-373.
- GRÖPPEL, HEINRICH. Ueber Kohlenanalysen und eine neue Form der Kohlenuntersuchungen. Ges. Abh. Kennt. Kohle 2: 185-202 (1918). Bibl. footnotes.
- COAL: Carbonization.**
- DAVIS, JOSEPH D. Review of published information on the low temperature carbonization of coal. Am. Gas Assoc., Tech. Sec., 2nd Ann. Convention, 105-138 (1920). 35 footnotes.
- FISCHER, F. Der heutige Stand der Kohlenforschung. Stahl u. Eisen 37: 372-373 (1917). 38 titles.
- GRÖPPEL, HEINRICH. Wissenschaftliche und technische Literatur ueber die Destillation der Steinkohle bei neiderer Temperatur und gewöhnlichem Druck. Ges. Abh. Kennt. Kohle 1: 92-113 (1917). Bibl. footnotes.
- McCULLOCH, ANDREW, and SIMPKIN, NEVILLE. Low temperature carbonization of bituminous coal. London, Witherby, 1923. 248 p. Bibl., p. 227-236. 125 references.
- PARR, S. W., and OLIN, H. L. Coking of coal at low temperatures. Univ. Ill., Eng. Expt. Sta., Bull. No. 60, 1912. 46 p. Bibl. footnotes.
- PORTER, HORACE C. Coal carbonization. New York, Chem. Cat. Co., 1924. 442 p. Bibl. footnotes, with author index.
- COAL: Gases.**
- PARR, S. W., and BARKER, PERRY. The occluded gases in coal. Univ. Ill., Eng. Expt. Sta., Bull. No. 32, 1909. 28 p. 22 footnotes.
- COAL: Nitrogen.**
- BERTELSMANN, —. Der Stickstoff der Steinkohle. Sammlung chem. chem.-tech. Vorträge 9: 410-414 (1904). 191 references.
- COAL: Pulverized.**
- CRAIG, HELEN M. Pulverized coal. Mechan. Eng. 36: Iv-lviii (1914). About 150 references, between 1875-1913.
- ENGINEERING SOCIETIES LIBRARY. Pulverized coal. Mechan. Eng. 43: 136 (1921). 283 references, covering the years 1910-1920. Annotated.
- HARVEY, LEONARD C. Pulverized coal systems in America. 2nd ed. London, Dept. Sci. Ind. Res., Fuel Res. Board, Special Rept. No. 1, 1922. 117 p. Bibl., p. 95-117. About 175 references. 3rd ed., 1923. 131 p. Bibl., p. 106-131.
- HERINGTON, C. F. Powdered coal as a fuel. 2nd ed. New York, Van Nostrand, 1920. 338 p. Bibl., p. 305-324. About 300 references.
- COAL: Storage.**
- AMERICAN ENGINEERING COUNCIL. Industrial coal: Purchase, delivery and storage. Report of a Committee of the American Engineering Council. New York, Ronald, 1924. 419 p. Bibl. on storage of coal, deterioration, spontaneous combustion, etc.
- PARR, S. W. Effects of storage upon the properties of coal. Univ. Ill., Eng. Expt. Sta., Bull. No. 97, 1917. 44 p. Bibl. footnotes.
- PARR, S. W., and KRESSMANN, F. W. The spontaneous combustion of coal. Univ. Ill., Eng. Expt. Sta., Bull. No. 46, 1910. "Historical review," p. 57-87. 40 footnotes.
- STOPES, MARIE C. C., and WHEELER, RICHARD V. The spontaneous combustion of coal. London, Colliery Guardian, 1923. 125 p. Bibl., p. 118-125.
- U. S. Library of Congress. List of references on the storage of coal. 1920. 10 p., mimeographed.

COAL: Weathering.

PORTER, J. B. Weathering of coal. Canada, Dept. Mines, Mines Br., Rept. No. 83, Suppl., 1915. Bibl., p. 184-188. 100 references.

COAL ASH

FIELDNER, A. C., HALL, A. E., and FIELD, A. L. The fusibility of coal ash and the determination of the softening temperature. U. S. Bur. Mines, Bull. No. 129, 1918. 146 p. Bibl., p. 119-138. 187 annotated references.

COAL DUST

RICE, GEORGE S., *et al.* Coal dust explosion tests in the experimental mine, 1913-1918, inclusive. U. S. Bur. Mines, Bull. No. 167, 1922. 639 p. Bibl., p. 591-625. In part in Bull. No. 20, 1911, p. 184-199, and U. S. Geol. Sur., Bull. No. 425, 1910, p. 168-182.

COAL TAR

CARO, H. Ueber die Entwicklung der Teerfarben-Industrie. Ber. 25: 955-1105 (1892). 558 references, including patents.

FABER, ALFRED. Entwicklung und Fortschritte in der Urteergewinnung und -verarbeitung. Z. angew. Chem. 36: 1-3, 11-14 (1923). 61 footnotes.

LUNGE, GEORGE. Coal-tar and ammonia. 3 vols. New York, Van Nostrand, 1916. References through text, with index of names.

MORGAN, J. J., and SOULE, ROLAND P. The examination of low temperature coal tars. Ind. Eng. Chem. 15: 587-693 (1923). 61 footnotes.

MORGAN, J. J., and SOULE, R. P. Studies in the carbonization of coal: characteristics of low temperature coal tar. Chem. Met. Eng. 26: 923, 978 (1922). Bibl. footnotes.

SPIELMANN, PERCY E. The constituents of coal tar. New York, Longmans, 1924. 219 p. Bibl., p. 193-207. 525 references.

WARNES, ARTHUR R. Coal-tar distillation and working up of tar products. 2nd ed. London, Gas World, 1914. 315 p.

WEISSGERBER, R. Chemische Technologie des Steinkohlenteers mit Berücksichtigung der Koksbereitung. Leipzig, Spamer, 1923. 139 p. See also DYES; INTERMEDIATES.

COALESCENCE

BANCROFT, WILDER D. Coalescence. In *his* Applied Colloid Chemistry, p. 146-171 (1921). 175 footnotes.

COBALT

COPAUX, H. Cobalt. In Moissan, Chim. min. 4: 144-244 (1905). 675 footnotes.

DRURY, CHARLES W. Cobalt, its occurrence, metallurgy, uses and alloys. Rept. Ontario Bur. Mines, 27, pt. 3, sec. 1. 1918. 133 p. Contains bibls. DRURY, C. W. Cobalt. Mineral Ind. 28: 137-139 (1919); 29: 139-141 (1920); 30: 142-145 (1921). 34 references.

FRIEND, J. NEWTON. Cobalt. In *his* Textbook, 9, pt. 1: 19-77 (1920). Bibl. footnotes.

GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. Cobalt. (1913-1919.) 1921. 22 p. Bibl., p. 20-22.

HALSE, EDWARD. Cobalt ores. (Imperial Inst. Monograph.) London, Murray, 1924. 54 p.

KALMUS, H. T., HARPER, C. H., and SAVELL, W. L. Electroplating with cobalt. Trans. Am. Electrochem. Soc. 37: 75-130 (1915). Bibl. footnotes.

MEUNIER, M. J. Cobalt. In Frémy, Enc. chim. 3, 12^e cahier: p. 267-273 (1889).

ROTH, W. Cobalt. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 190-586, 1441-1544 (1909). References through text.

WATTS, OLIVER P. The electrodeposition of cobalt and nickel. Trans. Am. Electrochem. Soc. 23: 150-152 (1913). 100 references.

COBALT: Analytical.

GROSSMANN, H. Die Bestimmungsmethoden der Nickels und Kobalts und ihre Trennung von den anderen Elementen. Stuttgart, Enke, 1913. 140 p. Bibl. footnotes.

COBALTAMMINES

PFEIFFER, P. Kobaltiake. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 297-512, 1452-1528 (1909). References through text.

See also COMPLEX COMPOUNDS.

COBALT CARBONATE

LEITMEIER, H. Kobaltcarbonat. In Doelter, Handb. Mineralchem. 1: 440-442 (1912). Bibl. footnotes.

ROTH, W. Kobaltkarbonate. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1, 247-262 (1909). References through text.

COBALT CHLORIDE

ROTH, W. Kobalt und Chlor. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 247-262 (1909).

COBALT OXIDE

HUTTNER, ERWIN. Beiträge zur Kenntniss der Oxyde des Kobalts. Z. anorg. Chem. 27: 81-124 (1901). 50 footnotes.

ROTH, W. Kobalt und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 204-214 (1909). References through text.

WITTEVEEN, H. J., and FARNUA, E. F. Colors developed by cobalt oxides. *J. Ind. Eng. Chem.* 13: 1061-1066 (1921).

COBALT SULFATE

ROTH, W. Kobaltsulfate. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 235-240 (1909). References through text.

COCAINE

"Cocaine and salts." *Ind.-Cat. S. G. O.*, 2nd ser., 3: 701-709 (1898); 3rd ser., 3: 1249-1253 (1922). Includes toxicology.

PELZ, RICHARD. Entgiftung des Cocains im Tierkörper unter der v. Esmarch'schen Ligatur. Dissertation, Bern, 1908. 104 p. *Bibl.*, p. 65-76.

ROTH, GEORGE B. Pharmacological studies with cocaine and novocaine. *U. S. Hyg. Lab., Bull.* No. 109, 1916. *Bibl.*, p. 65-67. 45 references.

SCHMIDT, JULIUS. Alkaloide der Cocablätter. *In* Abderhalden, *Biochem. Handl.* 5: 93-108 (1911). 90 footnotes.

See also ALKALOIDS.

CODEINE

"Codein." *Ind.-Cat. S. G. O.*, 1st ser., 3: 242 (1882); 2nd ser., 3: 715 (1898); 3rd ser., 3: 1259 (1922). 60 references.

SCHMIDT, JULIUS. Codein. *In* Abderhalden, *Biochem. Handl.* 5: 277-296 (1911). 90 footnotes.

See also ALKALOIDS.

COD-LIVER OIL

"Cod-liver oil." *Ind.-Cat. S. G. O.*, 1st ser., 3: 242-244 (1882); 2nd ser., 3: 716-717 (1898); 3rd ser., 3: 1261 (1922). Includes therapeutic use.

See also FATS, OILS, WAXES.

COFFEE

BOUTILLY, V. Le caféier de Libéria, sa culture et sa manipulation. Paris, Challamel, 1900. 137 p.

"Coffee." *Ind.-Cat. S. G. O.*, 1st ser., 3: 245-247 (1882); 2nd ser., 3: 720-722 (1898); 3rd ser., 4: 1-2 (1923). Includes adulteration and substitutes.

SPENCER, G. L. Bibliography of the literature on coffee. *U. S. Dept. Agr., Bur. Chem., Bull.* No. 13, pt. 7: 993-995 (1892).

TRIGG, CHARLES W. Aging green coffee. *Tea and Coffee Trade J.* 39: 440-442 (1920). 15 patents quoted.

UKERS, WM. H. All about coffee. New York, Tea and Coffee Trade J., 1922. *Bibl.* p. 738-768.

See also FOODS (Vereinbarungen).

COHENIT. *See* IRON CARBIDE.

COKE

COLQUHOUN, W. Some economic considerations in coke oven practice. *Proc. Am. Inst. Min. Eng.* 56: 61-90, 153-162 (1919). 165 references.

GEORGE, WM. H. Moisture in blast furnace coke. *J. Soc. Chem. Ind.* 38: 394-396T (1919).

HOFMAN, H. O. Coke. *In* his *General metallurgy*, p. 225-284 (1913). *Bibl.* footnotes.

MCLELLAND, E. H. By-product coking; references to books and magazine articles. *Carnegie Library of Pittsburgh*, 1915. 40 p. Mimeographed supplement covering May, 1915, to June, 1921, issued in 1921.

SIMMERSBACH, O. *Koks-Chemie*. 2nd ed. Berlin, Springer, 1914. 314 p.

See also COAL, GAS MANUFACTURE.

COLCHICINE

"Colchicin and colchicum." *Ind.-Cat. S. G. O.*, 1st ser., 3: 253-254 (1882); 2nd ser., 3: 733-734 (1898).

See also ALKALOIDS.

COLLARGOL

BOLTENSTERN, O. v. Das Kollargol. *Z. Chemotherap.* 3: 763-787 (1914).

"Collargol." *Ind.-Cat. S. G. O.*, 2nd ser., 15: 636-638 (1910); 3rd ser., 4: 20 (1923).

COLLODION

BIGELOW, S. L., and GEMBERLING, A. Collodion membranes. *J. Am. Chem. Soc.* 29: 1576-1589 (1907). 25 references.

"Collodion." *Ind.-Cat. S. G. O.*, 1st ser., 3: 297-298 (1882); 2nd ser., 3: 759 (1898); 3rd ser., 4: 24 (1923).

EGGERTH, ARNOLD H. Preparation and standardization of collodion membranes. *J. Biol. Chem.* 48: 203 (1921). 12 references.

WORDEN, EDWARD C. Celloidin or collodion sacs. Pharmaceutical collodions. Collodion in the photographic art. *In* his *Technology of cellulose esters* 1: 2784-2795 (1921). *Bibl.* footnotes.

See also LACQUERS (Worden).

COLLOIDS

ALEXANDER, JEROME. The colloidal state in metals and alloys. *In* Colloid symposium monograph, Univ. Wisconsin, 1923, p. 297-317. 42 footnotes.

ARNDT, KURT. Die Bedeutung der Kolloide für die Technik, allgemeinverständlich dargestellt. Dresden,

COLLOIDS—*Cont'd*

- Steinkopff, 1920. 53 p. Bibl. footnotes.
- ARON, HANS. Ueber organische Kolloide. I. Die kolloidalen Lösungen. II. Die kolloidalen Zustandsänderungen und ihre Beziehungen zu einigen biologischen Fragen. *Biochem. Centr.* 3: 461-468, 501-512 (1904); 4: 505-514, 553-561 (1905). 326 references.
- BACHMANN, WILHELM. Ueber den Feinbau der Gele. *Kolloid-Z.* 23: 85-101 (1918). 60 footnotes.
- BACHMANN, W. Methoden zur Erforschung der feineren Struktur von Gelen und Gallerten. *In* Abderhalden, *Handb. biol. Arbeitsm.* 3B: 1-31 (1920). Bibl. footnotes.
- BACHMANN, W. Ultramikroskopische Studien an Seifenlösungen und -gallerten. *Kolloid-Z.* 11: 145-157 (1912). Bibl. footnotes.
- BANCROFT, WILDER D. *Applied colloid chemistry, general theory.* New York, McGraw, 1921. 345 p. Many hundred footnotes.
- BANCROFT, W. D. *Colloid chemistry and electrochemistry.* *Trans. Am. Electrochem. Soc.* 37: 55-70 (1920). 63 footnotes.
- BANCROFT, WILDER D. *Outline of colloid chemistry.* *J. Franklin Inst.* 185: 29-57, 199-230, 373-387 (1918). 400 footnotes.
- BARY, PAUL. *Les colloides.* Paris, Dunod, 1921. 495 p. Bibl. footnotes.
- BEANS, H. T., and EASTLACK, H. E. Electrical synthesis of colloids. *J. Am. Chem. Soc.* 37: 2667-2683 (1915). Bibl. footnotes.
- BOGUE, ROBERT H., *ed.* The theory and application of colloidal behavior, contributed by the foremost authorities in each division of the subject. New York, McGraw, 1924. 2 v. Bibl. at end of chapters.
- BROSSA, A., and FREUNDLICH, H. Flockung und Peptisierung von Albuminsolen durch Suspensionskolloide in elektrolythaltigen Lösungen. *Z. physikal. Chem.* 89: 306-337 (1914-15). Bibl. footnotes.
- BURTON, ELI F. *The physical properties of colloidal solutions.* 2nd ed. New York, Longmans, 1921. 221 p. "Colloids." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 25-32 (1923).
- CZAPEK, F. Allgemeine Betrachtungen ueber Kolloide. *In his* *Biochemie der Pflanze*, 3rd ed., 1: 24-50 (1922). Bibl. footnotes.
- DOELTER, C., and CORNU, F. Die Anwendung der Kolloidchemie auf Mineralogie und Geologie. *Kolloid-Z.* 4: 275-285 (1909). 35 references.
- DUCLAUX, JACQUES. Die Filtration kolloider Lösungen. *Kolloid-Z.* 3: 126-134 (1908). 40 footnotes.
- DUMANSKI, A. V. [Bibliographie des colloids.] Kijev, 1909. 81 p. (In Russian).
- FREE, E. E. Colloids and colloidal slimes. *Eng. Min. J.* 101: 249-254, 429-432, 509-512, 681-686 (1916). About 100 references.
- FREUNDLICH, HERBERT. *Kapillarchemie.* 2nd ed. Leipzig, 1922. 1181 p. Bibl. footnotes.
- GANN, JOHN A. Ueber die Koagulationsgeschwindigkeit des $Al(OH)_3$ sols. *Kolloidchem. Beihefte* 8: 63-138 (1916). Bibl. footnotes.
- GUTBIER, A., HUBER, J., and KRIVOSS, Z. Allgemeine kolloidchemische Untersuchungen ueber den Tragantschleim. *Kolloid-Z.* 18: 141-152 (1916). 48 footnotes.
- GUTBIER, A., HUBER, A., and KUHN, E. Allgemeine kolloidchemie Untersuchungen ueber den Leimsamenschleim. *Kolloid-Z.* 18: 201-210 (1916). 39 footnotes.
- GUTBIER, A., and KRAUTLE, NORA. Allgemeine kolloidchemische Untersuchungen ueber den Salepschleim. *Kolloid-Z.* 20: 83-101 (1917). 49 footnotes.
- HAHN, FRIEDRICH V. v. Ueber die Herstellung und Stabilität kolloider Lösungen anorganischer Stoffe (mit besonderer Berücksichtigung der Sulfidsole). *Sammlung chem. chem.-tech. Vorträge* 26: 379-453 (1922). Bibl. footnotes.
- HANDOVSKY, HANS. Der kolloide Zustand. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 2: 48-110 (1923). 193 footnotes.
- HIMMELBAUER, ALFRED. Die Bedeutung der Kolloidchemie für die Mineralogie. *Fortschr. Mineral.* 3: 32-37 (1913). 127 references.
- HÖBER, RUDOLF. Die Kolloide. *In his* *Physikalische Chemie der Zelle*, 4th ed., p. 255-348 (1914). Bibl. footnotes.
- HOLMES, HARRY N. *Bibliography of colloid chemistry.* Washington, National Research Council, 1923. 135 p., mimeographed. About 1800 references.
- HOLMES, HARRY N. Formation of crystals in gels. *J. Franklin Inst.* 184: 743-773 (1917). 38 footnotes.
- KATZ, J. R. Die Gesetze der Quellung. I. Die Quellung in Wasser ohne Komplikationen. *Kolloidchem. Bei-*

- hefte 9: 1-182 (1917). Bibl. footnotes.
- KINDSCHER, E. Kolloidchemie. Fortschritte Chem. 7: 281-292 (1913); 10: 129-143 (1914-15); 11: 171-184 (1915-16); 13: 59-74, 129-142 (1917-18); 16: 61-72 (1920). References through text.
- KOPACZEWSKI, W. Théorie et pratique des colloïdes en biologie et en médecine. Paris, Vigot, 1923, 308 p. Bibl., p. 287-300.
- KRUYT, H. R. Strömungspotentials und Kolloidstabilität. Kolloid-Z. 22: 81-98 (1918). 50 footnotes.
- KUHN, A. [Survey of our present knowledge of hydration in colloids.] Kolloid-Z. 35: 275-294 (1924). 112 references.
- LIESEGANG, RAPHAEL ED. Kolloidchemie, 1914-1922. Dresden, Steinkopff, 1922, 100 p. Bibl. footnotes.
- LIESEGANG, RAPHAEL ED. Kolloide in der Technik. Dresden, Steinkopff, 1923, 157 p. Bibl. footnotes.
- LIESEGANG, RAPHAEL ED. Spezielle Methoden der Diffusion in Gallerten. In Abderhalden, Handb. biol. Arbeitsm. 3B: 33-130 (1920). Bibl. footnotes.
- LITERATUR-ÜBERSICHT. Kolloid-Z. 6: 51, 123, 225, 274 (1910); 7: 49, 103, 167, 227, 308 (1910); 8: 49, 101, 167, 211, 260, 326 (1911); 9: 29, 86, 138, 195, 244, 308 (1911); 10: 49, 105, 198, 253, 306 (1912); 11: 43, 84, 124, 200, 242, 294 (1912); 12: 55, 99, 158, 201, 317 (1913); 13: 68, 172, 272 (1913); 14: 50, 196 (1914); 15: 51, 98 (1914); 16: 22, 82, 162 (1915); 17: 53, 148 (1915); 18: 20, 210 (1916); 19: 50, 191 (1916); 20: 46 (1917); 21: 32 (1917); 24: 73, 104 (1919); 25: 161, 247 (1919); 26: 180, 225 (1920); 27: 326 (1920). About 325 pages of bibl., forming a practically complete, classified list for the period 1910-1920.
- LOTTERMOSER, A. Die Arbeiten mit Schutzkolloiden. In Abderhalden, Handb. biol. Arbeitsm. 3B: 221-294 (1922). Bibl. footnotes.
- LOTTERMOSER, A. Methoden der Herstellung kolloider Lösungen. In Abderhalden, Handb. biol. Arbeitsm. 3B: 131-220 (1922). Bibl. footnotes.
- LOTTERMOSER, A. Ueber die Darstellung kolloider Elemente. Z. angew. Chem. 21: 632-639 (1908). 59 footnotes.
- MELLOR, J. W. Colloidal solutions. In his Inorg. theor. Chem. 3: 536-564 (1923). Flocculation and deflocculation, 200 references; preparation, 50 references; colloidal gold, silver, copper, 125 references.
- MUELLER, A. Kolloidchemie. Fortschritte Chem. 1: 80-92 (1909); 2: 169-180 (1910); 3: 283-294 (1910-11). References through text.
- MÜLLER, ARTHUR. Bibliographie der Kolloide. Z. anorg. Chem. 39: 122-151 (1904). Also as separate, Hamburg, Voss, 1904, 32 p. 356 references by authors with subject index.
- MÜLLER, ARTHUR. Allgemeine Chemie der Kolloide. Leipzig, Barth, 1907, 204 p. Bibl. footnotes.
- MUKHERJEE, J. N. The origin of the charge on a colloidal particle and its neutralization by electrolytes. Trans. Faraday Soc. 16: 103-115 (1921). 30 references.
- MUNK, FRITZ. Die Bedeutung der Kolloide im Organismus und ihre chemische Beeinflussung. Z. Chemothérap. 1: 983-985 (1912). 62 references.
- OSTWALD, WOLFGANG. Die wichtigsten Eigenschaften des kolloiden Zustandes der Stoffe. In Oppenheimer, Handb. Biochem. 1: 839-922 (1909). 120 references.
- OSTWALD, W. Grundriss der Kolloidchemie. Dresden, Steinkopff, 1910, 525 p. Bibl. footnotes. Bibl., p. 74-76.
- PAULI, W. Allgemeine physicochemie der Zellen und Gewebe. Eigenschaften organischer Gallerten. Ergeb. Physiol. 3: 154-155 (1904). 24 references. Quellung und Erstarrung von Gallerten unter Beteiligung von Kristalloiden. *Ibid.* 6: 106-7 (1907). 23 references.
- PÖSCHL, VIKTOR. Einführung in die Kolloidchemie. 5th ed. Leipzig, Steinkopff, 1919, 148 p. Bibl., p. 138-140.
- RALSTON, OLIVER C. The control of ore slimes. Eng. Mining J. 101: 763, 890, 990 (1916). Bibl. footnotes.
- RIDEAL, ERIC K. Colloid phenomena in bacteriology. In 5th report on colloid chemistry, 31-38 (1923). 26 references.
- SAMEC, MAX. Studien über Pflanzenkolloide. (Starch). Kolloidchem. Beihefte 3: 125-160 (1912); 4: 132-174 (1912); 5: 141-210 (1913); 6: 23-54 (1914); 7: 137-171 (1915). About 225 footnotes.
- SVEDBERG, THE. Die Ergebnisse der Kolloid-Forschung. Ber. 47: 12-38 (1914). Bibl. footnotes.
- SVEDBERG, THE. Colloid chemistry technique. In Colloid symposium monograph, Univ. Wisconsin, 1923, p. 75-94. 56 footnotes.

COLLOIDS—*Cont'd*

- SVEDBERG, THE. Colloid chemistry; Wisconsin lectures. New York, Chem. Cat. Co., 1924. 265 p. Bibl., p. 251-257. 319 references.
- SVEDBERG, THE. Die Methoden zur Herstellung kolloider Lösungen anorganischer Stoffe. Ein Hand- und Hilfsbuch für die Chemie und Industrie der Kolloide. Dresden, Steinkopff, 1909. 512 p. Bibl. at beginning of chapters.
- SVEDBERG, THE. The formation of colloids. London, Churchill, 1921. 127 p. Bibl. at end of chapters.
- SVEDBERG, THE. Short survey of the physics and chemistry of colloids. Trans. Faraday Soc. 16, suppl.: 2-13 (1921). 57 references.
- TSCHUMANOFF, S. Bibliographie der kolloiden Metalloxyde und Metallhydroxyde. Kolloid-Z. 10: 255-260 (1922). 180 references, arranged by elements.
- VANZETTI, B. L. Alcuni fatti nuovi nella chimica dei colloidi. Ann. chim. appl. 3: 37-61 (1915). 80 footnotes.
- VARGA, GEORG. Beitrag zur Kenntniss der elektrischen Eigenschaften sowie der Peptisation von Kolloide. Kolloidchem. Beiheft 11: 1-33 (1919). Bibl. footnotes.
- WEIMARN, P. P. von. Russische Arbeiten auf dem Gebiete der Kolloid Chemie, 1869-1907. Kolloid-Z. 2: xxviii-xxxii (1907).
- WEISER, HARRY B. The formation of inorganic jellies. In Colloid symposium monograph, Univ. Wisconsin, 1923, p. 38-61. 50 footnotes.
- WHITNEY, W. R., and OBER, J. E. An index to the literature of colloids. J. Am. Chem. Soc. 23: 856-863 (1910). 149 references. Chronological 1851-1901.
- WILSON, JOHN A. The electrical charge on colloids. In Third report on colloid chemistry, 1920, p. 50-51.
- ZSIGMONDY, RICHARD A. Kolloidchemie; ein Lehrbuch, 4th ed. Leipzig, Spamer, 1922. 429 p. Bibl. footnotes.
- Serial*
- Kolloid-Zeitschrift. Zeitschrift für wissenschaftliche und technische Kolloidchemie. Leipzig, Steinkopf. 1906-. "Referate": General capillary physics; general capillary chemistry; general colloid chemistry; special experimental colloid chemistry; methods; mineralogy and agricultural chemistry; biochemistry and physiology; medicine and pharmacology; technical—subdivided according to industries.
- Revue generale des colloides et de leurs applications industrielles. Paris, Dunod. 1923-. Classification: General, analytical, biology, metals and alloys, ceramics, textiles, paper, wood, artificial textiles, dyes, oils, fats and waxes, resins, paints and varnishes, photochemistry, photography, tanning and leather, glue, rubber, artificial plastics, medical products, foods, filtration, electrochemistry, mineral colloids.
- See also ADSORPTION, ARSENIC, BAUXITE, BREAD, CARBON, CHROMIUM, CLAY, COAGULATION, COLLARGOL, COPPER, DAIRY PRODUCTS, DYES, ELECTROPLATING, ENZYMES, FERMENTATION, FIBERS, FLOCCULATION, FLOTATION, GELATINE, GELS, GLUE, GOLD, INK, IODINE, LIESGANG PHENOMENON, LIPOIDS, MANGANESE, MERCURY, MILK, MOLYBDENUM, MUSCLE, NITROCELLULOSE, PAINT, PALLADIUM, PECTIN, PEPTIZATION, PHOTOGRAPHY, PHYSIOLOGY, PLANT SLIME, PLATINUM, PROTEINS, PROTOPLASM, RADIUM, RUBBER, SILICIC ACID GEL, SILICON, SILVER, SOAP, SOIL COLLOIDS, SULFUR, TANNIN AND TANNING, TIN, TUNGSTEN.
- COLOR**
- CURTISS, RICHARD S. The cause of color in organic compounds. J. Am. Chem. Soc. 32: 795-809 (1910). 75 references.
- GEBHADD, KURT. Zusammenhang zwischen Lichtempfindlichkeit und Konstitution von Farbstoffen. J. prakt. Chem. 192: 561-625 (1911). Bibl. footnotes.
- KAUFMANN, HUGO. Ueber den Zusammenhang zwischen Farbe und Konstitution bei organischen Verbindungen. Sammlung chem. chem.-tech. Vorträge 9: 277-328 (1904). Bibl. footnotes.
- LEY, H. Ueber die Beziehungen zwischen Lichtabsorption und chemischer Konstitution bei organischen Verbindungen. Z. angew. Chem. 20: 1303-1321 (1907). 66 footnotes.
- STORBE, HANS. Beziehungen zwischen der Farbe und der Constitution ungesättigter Ketone und ihrer Salze. Ann. 370: 93-141 (1909). Bibl. footnotes.
- WATSON, E. R. Color in relation to chemical constitution. New York, Longmans, 1918. 197 p. Bibl., p. 181-190, 225 references, classified.
- See also DYES.

COLORIMETRY

DEHN, WM. M. Fallacies in colorimetry. *J. Am. Chem. Soc.* 39: 1392-1398 (1917). 50 references, chronological by journal.

DEHN, WM. M., and BALL, OLIVE A. Colorimetric studies of picrate solutions. *J. Am. Chem. Soc.* 39: 1381-1392 (1917). 100 references.

KLETT MFG. Co. Colorimetric methods. In "The Kober" nephelometer-colorimeter, n. d., p. 10-12. 34 references on colorimetric methods, 16 on nephelometric methods.

TROLAND, L. T. Report of committee on colorimetry for 1920-1921. *J. Optical Soc. Am.* 6: 592-596 (1922). 98 references.

COLOSTRUM

BAUER, J. Die Biologie des Kolostrums (einschliesslich Fermente). *Ergeb. Physiol.* 11: 104-106 (1911). 44 references.

BURR, A., BERBERICH, F. M., and BERG, A. Untersuchungen über Kolostralmilch, mit spezieller Berücksichtigung des Spontanerums und des Fettes. *Chem.-Ztg.* 37: 69, 97, 146 (1913). 45 footnotes.

"Colostrum." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 70-71 (1923).

ENGEL, ST. Die Biochemie des Kolostrums. *Ergeb. Physiol.* 11: 42-44 (1912). 77 titles.

WEBER, E. [Investigation on the colostrum milk of the cow, the goat and the sheep.] *Milchw. Zentrbl.* 6: 433, 491, 543 (1910). 164 references.

See also MILK, URINE (Neuberg).

COLUMBIUM

CHILESOTTI, —. Niob. In Abegg, *Handb. anorg. Chem.* 3, pt. 3: 837-838 (1907). 58 references.

TRAPHAGEN, FRANK W. Index to the literature of columbium, 1801-1887. *Smithsonian Misc. Coll.*, 34, No. 3 (Pub. 663), 1888. 27 p.

MONIOTTE, M. Niobium. In Moissan, *Chim. min.* 2: 124-142 (1905). 155 footnotes.

COMBUSTION

FRIEND, JOHN A. N. The chemistry of combustion. London, Gurney, 1922. 110 p. *Bibl.*, p. 101-107.

See also COAL, COKE, FUELS, SURFACE COMBUSTION.

COMPLEX COMPOUNDS

BILTZ, WILHELM. Ueber das Vermögen kristallisierter Salze Ammoniak zu binden. *Z. anorg. allgem. Chem.* 130: 93-139 (1923). *Bibl.* footnotes.

EPHRAIM, F. Chemische Komplexverbindungen. *Fortschritte Chem.* 3: 221-231 (1910-11); 4: 341-358 (1911); 6: 167-183 (1912-13); 8:

195-208 (1913); 10: 209-214, 243-259 (1914-15); 13: 7-32 (1917-18). References through text.

GROSSMANN, H. Chemische Komplexverbindungen. *Fortschritte Chem.* 1: 250-261 (1909).

GUTHIER, A. Chemie de Verbindungen höherer Ordnung im Jahre 1915. *Z. angew. Chem.* 29: 161-166 (1916). 41 footnotes.

MELLOR, J. W. Double and complex salts. In *his* *Inorg. theor. chem.* 2: 223-228 (1922). 50 references.

MICHEL, E. Chemische Komplexverbindungen. *Fortschritte Chem.* 15: 53-88 (1919-20).

PFEIFFER, P. Hexaminsalze und Heptaminsalze u.s.w. *Z. anorg. Chem.* 24: 302-304 (1900). 45 references.

PFEIFFER, PAUL. Organische Molekülverbindungen. Stuttgart, Enke, 1922. 328 p. *Bibl.* footnotes.

ROSENHEIM, A. Heteropolysäuren. In Abegg, *Handb. anorg. Chem.* 4, pt. 1, 2nd half: 1054-1064 (1920). 500 references.

SCHWARZ, ROBERT. The chemistry of the inorganic complex compounds; an introduction to Werner's coordination theory. New York, Wiley, 1923. 82 p. *Bibl.* footnotes.

THOMAS, WM. Complex salts. New York, Van Nostrand, 1924. 122 p. *Bibl.* footnotes.

WERNER, ALFRED. Beitrag zur Konstitution anorganischer Verbindungen. XV. Ueber Chlorosalze. *Z. anorg. Chem.* 19: 158-178 (1899). 265 references.

See also CALCIUM SULFATE (Mellor); COPPER CHLORIDES; CUPRAMMONIUM SALTS; HALIDES, DOUBLE; MERCURIC AMMONIUM COMPOUNDS; MERCURIC CHLORIDE; MERCURIC IODIDE.

COMPRESSIBILITY

LANDOLT-BÖRNSTEIN. Kompressibilität flüssiger und gasförmiger Körper. In *their* *Tabellen*, 4th ed., 1912, p. 67-68; 5th ed., 1923, 102-103, 119. About 125 references.

RICHARDS, THEODORE W. Present aspects of the hypothesis of compressible atoms. *J. Am. Chem. Soc.* 36: 2419-2439 (1916). *Bibl.* footnotes and list of 22 papers by Richards. See also *Ibid* 36: 624-625 (1914). 20 references.

CONCRETE

ABRAMS, DUFF A. Effect of curing conditions on the wear and strength of concrete. *Structural Materials Res. Lab., Lewis Inst. Chicago, Bull.* No. 2. *Proc. Am. Railway Engr. Assoc.*, 29 (1919). *Bibl.*, p. 27-32.

CONCRETE—Cont'd

- ABRAMS, DUFF A. Effect of tannic acid on the strength of concrete. Structural Materials Res. Lab., Lewis Inst., Chicago, Bull. No. 7. 29 p. Reprinted from Proc. Am. Soc. Testing Materials, 20, pt. 1: 309-339 (1920). Bibl., p. 27-29.
- ABRAMS, DUFF A. Effect of hydrated lime and other powdered admixtures in concrete. Structural Materials Res. Lab., Lewis Inst., Chicago, Bull. No. 8, 1920. 74 p. Bibl., p. 54-55.
- BROOKLYN PUBLIC LIBRARY. Concrete and cement. A list of books in the Brooklyn Public Library. 1918. 12 p.
- ELLIOTT, G. R. B. Effects of organic decomposition products from high vegetable content soils upon concrete drain tile. J. Agr. Res. 24: 499-500 (1923).
- FABER, OSCAR, and CHILDE, H. K. Bibliography of concrete and reinforced concrete. In Concrete year book, 1924: 116-124.
- HOYT, W. A. [The effect of temperature on concrete.] Tonind. Ztg. 38: 552-553.
- HUMPHREY, RICHARD L. Waterproof concrete. Trans. Intern. Engr. Congr. 1915, Material of Engr. Construction, p. 313-320.
- PORTLAND CEMENT ASSOCIATION. Catalog of books, periodicals and pamphlets in the Library of the P. C. A. Chicago, 1918. 47 p. Classified by uses. Author index.
- THOMPSON, SANFORD E. Concrete aggregates. Trans. Intern. Engr. Congr., 1915, Materials of Engr. Construction, p. 217-219. 45 references.
- WHITE, A. H. Volume changes in concrete. Trans. Intern. Engr. Congr., 1915, Materials of Engr. Construction, p. 271-273. 33 references.
- See also CEMENT.*
- CONCRETE: Electrolysis.**
- ROSA, E. B., *et al.* Electrolysis in concrete. U. S. Bur. Standards, Tech. Paper No. 18, 1919. 24 references.
- CONCRETE: Reinforced.**
- AMERICAN SOCIETY OF CIVIL ENGINEERS. Bibliography of reinforced concrete posts and telegraph poles, 1903-1914. Bull. Am. Railway Eng. Assoc. 18: 395-399 (1916). 70 references.
- AMERICAN SOCIETY OF CIVIL ENGINEERS. List of articles on the manufacture and use of concrete pipe, 1908-1914. Proc. Am. Railway Bridge and Building Assoc. 25: 296-307 (1914). Chronological.
- AMERICAN SOCIETY OF CIVIL ENGINEERS. List of articles on the manufacture and use of concrete piles. Proc. Am. Railway Bridge and Building Assoc. 25: 275-283 (1915). Covers 1908-1914. Chronological.
- COLBY, ALBERT L. Reinforced concrete in Europe, including its application, economies and endurance; . . . and finally a complete bibliography of books and periodicals on reinforced concrete and cement. South Bethlehem, Pa., 1909. 260 p.
- FERET, RENE. Étude expérimentale du ciment armé. Paris, 1906. 777 p. Bibl., p. 338-480.
- FITZINGER, A. Zeitschriftenschau der gesamten Eisenbetonliteratur 1913. Berlin, Ernst, 1914. 86 p. Classified.
- HOFFMANN, —. Die Eisenbetonliteratur bis ende 1910. Beton u. Eisen, 1911. 39 p.
- MOREL, MARIE A. Le ciment armé et ses applications. Paris, 1902. 158 p. Bibl., p. 153-155.
- CONDENSATION NUCLEI**
- STRONG, W. W. Relation between electrification and chemical reactions and the properties of condensation nuclei. Am. Chem. J. 50: 100-131 (1913). 100 references.
- CONDENSERS**
- FRIEDRICHS, FRITZ. Ueber Kühler. Z. angew. Chem. 33: 29-32 (1920). 45 footnotes.
- See also CHEMICAL APPARATUS.*
- CONDIMENTS.** *See* FOODS (Vereinbarungen).
- CONDUCTIVITY.** *See* ELECTRICAL CONDUCTIVITY, THERMAL CONDUCTIVITY.
- CONDUCTIVITY WATER**
- KENDALL, JAMES. Preparation of conductivity water. J. Am. Chem. Soc. 38: 1480-1497, 2460-2466 (1916). 25 references.
- KLUT, HARTWIG. Gegenwärtiger Stand unserer Kenntniss über die Bedeutung der freien Kohlensäure im Leitungswasser. Zentr. ges. Hyg. 3: 185-186 (1923). 70 references.
- CONFECTIONERY.** *See* CANNING and PRESERVING (Rousset).
- CONIINE**
- "Coniine." Ind.-Cat. S. G. O., 1st ser., 3: 338 (1882); 2nd ser., 3: 814-815 (1898); 3rd ser., 4: 99 (1923).
- SCHMIDT, JULIUS. *a-Coniin.* In Abderhalden, Biochem. Handl. 5: 7-10 (1911). Bibl. footnotes.
- See also ALKALOIDS.*

COPPER

- BENNETT, C. W. The electrodeposition of copper. *Trans. Am. Electrochem. Soc.* 23: 233-250 (1913). 65 references.
- "Copper and its salts." *Ind.-Cat. S. G. O.*, 1st ser., 3: 408-411 (1882); 2nd ser., 3: 913-914; 3rd ser., 4: 171-172 (1923).
- DONNAN, F. G. Kupfer. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 1: 638-654 (1907). 754 references.
- GR. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Copper. (1913-1919.) 1922. 203 p. *Bibl.*, p. 173-203.
- GUTBIER, A., and SAUER, E. Ueber kolloides Kupfer. *Kolloid-Z.* 25: 145 (1919). 28 references.
- LOTTERMOSER, —. Kolloidchemie des Kupfers. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 1: 663-664 (1907). 33 references.
- MELLOR, J. W. Copper. *In his* *Inorg. theor. chem.* 3: 1-295 (1923). History, p. 4, 35 references; occurrence, p. 8-10, 500 references; separation, p. 19-21, 400 references; physical properties, p. 60-69, 800 references; chemical properties, p. 104-110, 700 references; atomic weight, p. 113, 50 references.
- PENZER, N. M. Copper. *In his* *Non-ferrous metals and other minerals*, 1924. *Bibl.*, p. 224-227.
- PETERS, FRANZ. Kupfer. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5: 587-1384, 1545-1595 (1909). References through text.
- ROUSSEAU, GUSTAVE. Le cuivre et ses composés. *In* Frémy, *Enc. chim.* 3, 14^e cahier: p. 124-127 (1885).
- SABATIER, P. Cuivre. *In* Moissan, *Chim. min.* 5: 1-151 (1906). 1595 footnotes.
- SIEVERTS, A., and WIPPELMANN, W. Die Struktur des elektrolytisch abgeschiedenen Kupfers. *Z. anorg. Chem.* 91: 1-45 (1915). *Bibl.* footnotes.
- U. S. Bureau of Standards. Copper. *Circular No. 73*, 2nd ed., 1922. *Bibl.*, p. 102-108. 303 references. *Bibl.* of 1st ed. appeared in *Chem. Met. Eng.* 18: 409-415 (1918).
- WEED, WALTER H. Copper. *Mineral Ind.* 25: 150-264 (1916); 26: 133-205 (1917); 27: 142-237 (1918); 28: 140-224 (1919); 29: 142-224 (1920); 30: 146-223 (1921). *Bibl.* footnotes.
- COPPER: Alloys.**
- CAMBI, LIVIO. [Action of the solvent and of the electrolyte on the electromotive force of the alloy, copper-zinc.] *Rend. ist. Lombardo* (2) 48: 826-840 (1915).
- HOYT, S. L. Ternary alloys of copper, tin and zinc. The kalcoids. *Trans. Am. Inst. Metals* 9: 364-390 (1915). 27 footnotes.
- MCCLELLAND, E. H. Brass: its mechanical properties, forging and heat treatment. *Forging-Heat Treating*, June, 1922, p. 260-261.
- PETERS, FRANZ. [Copper alloys.] *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 1 (1909). Al, 1158-1170; As, 1221-1225; Fe, 1330-1333, 1358-1361; Mg, 1154-1156; Mn, 1211-1214; Ni, 1361-1366, 1370-1378; Sb, 1243-1247; Si, 1173-1180; Sn, 1297-1318; Te, 1256-1258; Zn, 1262-1285.
- PITTSBURGH TESTING LABORATORY. Bibliography of patents covering union of copper or its alloys with iron or steel, by the aid of heat. *J. Ind. Eng. Chem.* 5: 893-895 (1913).
- TAKE, E. Properties of aluminium manganese bronze. *Trans. Faraday Soc.* 8: 169-180 (1912). 45 footnotes.
- See also ALLOYS.
- COPPER: Analytical.**
- CROASDALE, STUART. Electrolytic assay of copper. *J. anal. Chem.* 5: 133-140 (1891). 60 footnotes.
- PETERS, FRANZ. Nachweis, Bestimmung und Trennung des Kupfers. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 1: 706-721 (1909). Classified.
- VAN BARNEVELD, CHARLES E. Sulfur dioxide method for determining copper minerals in partly oxidized ores. *U. S. Bur. Mines, Tech. Paper* 198, 1918. 14 p. *Bibl.*, p. 12-14.
- COPPER: Metallurgy.**
- CLARK, JOHN D. A chemical study of the enrichment of copper sulfide ores. *Univ. New Mexico, Bull.* No. 75 (Chem. series, 1, No. 2), 1914. *Bibl.*, p. 142-148. "Covers the most important publications on enrichment."
- GOODRICH, ROBERT R. The hydro-electrolytic treatment of copper ores. *Trans. Am. Electrochem. Soc.* 25: 207-242 (1914). References through text.
- HOFMAN, H. O. The metallurgy of copper. 2nd ed. New York, McGraw, 1924. 419 p. *Bibl.* footnotes.
- LAIST, FREDERICK. Advances in copper smelting. *Trans. Inter. Eng. Congr.*, 1915, Metallurgy, p. 111-114. 56 references.
- LEVY, DONALD M. Modern copper smelting. London, Griffin, 1912, 259 p. *Bibl.* at ends of chapters.
- LUTRELL, ESTELLE. Bibliography of Arizona mining, metallurgy and

COPPER: Metallurgy—Cont'd

geology. Univ. Arizona, Bull. 23 (Econ. series, No. 7), 1915. 49 p.

PETERS, FRANZ. Neuerungen in der Elektrometallurgie des Kupfers. Glückauf 41: 757-761 (1905); 42: 1644-1653 (1906); 45: 515-520 (1909); 51: 797, 827, 845, 875, 893, 920 (1915). Bibl. footnotes.

COPPER: Ores.

ALLEN, ROBERT. Copper ores. (Imperial Inst. Monographs.) London, Murray, 1923. 221 p. Bibl., p. 206-221.

COPPER BROMIDES

MELLOR, J. W. Copper bromides. *In his* Inorg. theor. chem. 3: 192-201 (1923). 100 references.

PETERS, FRANZ. Kupfer und Brom. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 934-944 (1909).

COPPER CARBONATES

HIMMELBAUER, A. Kupfercarbonat. *In* Doelter, Handb. Mineralchem. 1: 459-477 (1912). Bibl. footnotes.

MELLOR, J. W. Copper carbonates. *In his* Inorg. theor. chem. 3: 267-280 (1923). 250 references.

PETERS, FRANZ. Kupferkarbonat. *In* Gmelin-Kraut, Handb. anorg. chem. 5, pt. 1: 990-998 (1909).

COPPER CHLORIDES

MELLOR, J. W. Copper chlorides. *In his* Inorg. theor. chem. 3: 157-191 (1923). 650 references on cuprous and cupric chlorides and complex salts.

PETERS, FRANZ. Kupfer und Chlor. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 887-910 (1909).

COPPER FLUORIDES

MELLOR, J. W. Copper fluorides. *In his* Inorg. theor. chem. 3: 154-156 (1923). 40 references.

PETERS, FRANZ. Kupfer und Fluor. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 884-887 (1909).

COPPER HYDROXIDES

MELLOR, J. W. Copper hydroxides. *In his* Inorg. theor. chem. 3: 141-147 (1923). 100 references.

See also COPPER OXIDE.

COPPER IODIDES

MELLOR, J. W. Cupric and cuprous iodides. *In his* Inorg. theor. chem. 3: 201-210 (1923). 75 references.

PETERS, FRANZ. Kupfer und Jod. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 944-958 (1909).

COPPER NITRATES

MELLOR, J. W. Copper nitrates. *In his* Inorg. theor. chem. 3: 280-287 (1923). 100 references.

PETERS, FRANZ. Cuprinitrate. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 798-806 (1909).

COPPER OXIDES

MELLOR, J. W. Copper suboxides; cupric oxide. *In his* Inorg. theor. chem. 3: 116-141 (1923). 600 references.

PETERS, FRANZ. Kupfer und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 723-789 (1909).

COPPER PHOSPHATES

MELLOR, J. W. Copper phosphates. *In his* Inorg. theor. chem. 3: 287-294 (1923). 100 references.

PETERS, FRANZ. Kupfer, Phosphor und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 968-976 (1909).

COPPER SILICATES

DOELTER, C. Kupfersilicate. *In his* Handb. Mineralchem. 2, pt. 1: 775-780 (1914).

COPPER SULFATES

MELLOR, J. W. Cuprous and cupric sulfates. *In his* Inorg. theor. chem. 3: 234-267 (1923). 500 references.

PETERS, FRANZ. Cupro- und Cuprisulfate. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 830-858 (1909).

COPPER SULFIDES

MELLOR, J. W. Cuprous and cupric sulfides. *In his* Inorg. theor. chem. 3: 210-231 (1923). 450 references.

PETERS, FRANZ. Kupfersulfide. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 806-824 (1909).

POSNJAK, E., ALLEN, E. T., and MERWIN, H. E. Die Sulfide des Kupfers. Z. anorg. Chem. 94: 95-138 (1916). Bibl. footnotes.

COPROSTEROL. See CHOLESTEROL.**CORK**

FREUND, —. Der Kork, seine Entstehung, Eigenschaften, Gewinnung und Verwertung. Pharm. Zentralhalle 55: 547, 573, 595, 624 (1914). Bibl. through text.

KAUSCH, OSCAR. Verfahren zur Herstellung von Kunstkorkmassen. Kunststoffe 1: 141-143 (1911); 3: 328-329 (1913). Patents.

CORN

BURTT-DAVY, J. Maize, its history, cultivation, handling and use. London, 1914. 831 p. 430 titles.

KEITH, M. HELEN. Bibliography of investigations bearing on the composition and nutritive value of corn and corn products. Washington, National Research Council, 1920. 178 p., mimeographed.

RAMMSTEDT, O. Die Bedeutung des Maiskorns als Nahrungsmittel. Z. oeffentl. Chem. 19: 288-294, 305-316, 327-334 (1913). 62 footnotes.

VER HULST, J. H., PETERSON, W. H., and FRED, E. B. Distribution of pentosans in the corn plant at various stages of growth. *J. Agr. Res.* 23: 662-663 (1923).

CORROSION

AMERICAN COMMITTEE ON ELECTROLYSIS. A preliminary report on electrolysis. *Bull. Am. Railway Eng. Assoc.* 18: 305-308 (1916). "A selected list of permanent value."

ANDEREGG, F. O., and ACHATZ, R. V. Bibliography of the self-corrosion of lead. *Bull. Purdue Univ.*, 8, No. 5: 41-45 (1924). 63 references. "Bibliography on electrolysis." *Bull. Am. Inst. Chem. Eng.*, 15, pt. 1: 164. 60 references.

BROWNELL, ELIJAH E. Report on the electric street railways of Milwaukee, Wis. 2nd ed. Philadelphia, the author, 1920. 184 p. *Bibl.*, p. 149-156.

CALCOTT, W. S., and WHETZEL, J. C. Laboratory corrosion tests. *Trans. Am. Inst. Chem. Eng.*, 15, pt. 1: 85-103 (1924). *Also in* CALCOTT, WHETZEL and WHITTAKER, Monograph on corrosion tests and materials of construction for chemical engineering apparatus. New York, 1923.

CARNEGIE LIBRARY OF PITTSBURGH. Bibliography of metal corrosion and protection. 2nd ed. *Mo. Bull., Library*, July, 1909. 61 p. *Also in* CUSHMAN and GARDNER, Corrosion and preservation of iron and steel, 1910; *in part in* SANG, Corrosion of iron and steel, 1910; and as a French translation in *Rev. Métal.* 11: 267-296 (1914). A supplement was published in *Proc. Engineer's Soc. Western Pa.* 31: 193-222 (1915).

CLARK, H. W., and GAGE, STEPHEN DEM. Studies of the relative corrosion of metal pipes by water, especially before and after purification. Review of the literature on corrosion. Reprinted from 42nd Annual rept. of the Mass. State Board of Health, 1911. 68 references.

FRIEND, J. N. Corrosion of iron and steel. New York, Longmans, 1911. 289 p. *Bibl. footnotes.*

FRIEND, J. N. Corrosion of iron. *In his Textbook*, 9, pt. 2: 67-77 (1921). *Bibl. footnotes.*

FRIEND, J. N. Corrosion of iron. Iron and Steel Inst., Carnegie Scholarship Mem., No. 11, 1922. 156 p. *Bibl. footnotes.*

HAMLIN, M. L., and TURNER, F. M., Jr. The chemical resistance of engineering materials. New York,

Chem. Cat. Co., 1923. 267 p. *Bibl. at ends of chapters.*

MAVEROFF, JOSE A. [Corrosion in metal tubes.] *Bol. asoc. Argentina de electro-tecnicos* 6: 3-8, 48-57, 81-86 (1920).

PARIS, G. The corrosion of iron and its prevention by the elimination of the gases dissolved in water. *Chimie & Industrie* 6: 11-32 (1921).

RAWDON, H. S., GROSSMAN, M. A., and FINN, A. N. Metallic coatings for rust-proofing iron and steel. *Chem. Met. Eng.* 29: 591-592 (1919). U. S. Bur. Standards, *Circ. No.* 80, 2nd ed. 1922. 72 references.

SELIGMAN, R., and WILLIAMS, P. References relating to the corrosion of aluminium by water. *J. Inst. Metals* 23: 183-184 (1920).

VAN PATTEN, NATHAN. Bibliography of the corrosion of metals and its prevention. Marblehead, Mass., Van Patten, 1923. 176 p. 2025 titles by authors with subject index.

WHITTAKER, HAROLD F. Research information surveys on corrosion of metals. No. 1, Nickel. 49 references. No. 2, Aluminium. 108 references. No. 3, Copper. 187 references. No. 4, Zinc. 175 references. No. 5, Tin. 130 references. No. 6, Lead. 213 references. Washington, National Research Council, 1923-1924.

CORUNDUM

BARLOW, A. E. Corundum, its occurrence, distribution, exploitation and uses. *Canada Geol. Sur., Mem.* 57 (*Geol. ser.*, No. 50), 1915. 377 p. *Bibl.*, p. 317-324. 68 references.

HOLLAND, T. H. Corundum. *In* Ball, A manual of the geology of India. Economic geology. 2nd ed. Part 1. Corundum. Calcutta, 1898. 79 p. *Bibl.*, p. 62-65. 59 titles.

LEWIS, J. V. Corundum and the basic magnesian rocks of western North Carolina. *N. C. Geol. Sur., Bull.* 11, 1896. 107 p. *Bibl.*, p. 99-101. 60 references.

PRATT, J. H., and LEWIS, J. V. Corundum and the peridotites of western North Carolina. *N. C. Geol. Sur.*, Vol. 1, 1905. 464 p. *Bibl.*, p. 401-420. 393 references.

COSMETICS

"Cosmetics." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 222-223 (1923).

TRUTTWIN, HANS. *Handbuch der kosmetischen Chemie.* Leipzig, Barth, 1920. 752 p. Contains *bibls.*

COTARNINE

MEYER-JACOBSON, Kotarnin. *In their Lehrb. org. Chem.* 2, pt. 3: 1035 (1918). 25 references.

See also ALKALOIDS.

COTTON

- ADDERLEY, ALBERT. The physical cause of luster in cotton. Shirley Inst. Mem. 2: 189-193 (1923). 17 references.
- ARMISTEAD, DOROTHY, and HARLAND, S. C. The destructive effect of microorganisms on raw cotton and cotton fibers. Shirley Inst. Mem. 2: 108 (1923). 15 references.
- BALLS, W. LAWRENCE. The cotton plant in Egypt. London, 202 p. Bibl., p. 181-190.
- "Cotton." Bull. Imp. Inst. 16: 84-89 (1918). List of reports appearing in the Bulletin, 1905-1917.
- CUNLIFFE, PERCY W. The action of light on cotton. Shirley Inst. Mem. 2: 248 (1923); J. Text. Inst. 14: 314-318T (1923). 19 references.
- FARGHER, R. G., and WITHERS, J. C. Chemical constituents of raw cotton. J. Text. Inst., 13: 1-16 (1922). 108 references.
- GIROLA, C. D. El algodonoero; su cultivo en las Varias Partes del mundo. Buenos Aires, 1910. 1092 p. Bibl., p. 1065-1074.
- "List of books relating to cotton and the cotton industry in the Library of the Franklin Institute, 1909." J. Franklin Inst. 167: 315-319 (1908).
- OPPEL, A. Die Baumwolle. Leipzig, Duncker, 1902. 745 p.
- PENZER, N. M. Cotton in British West Africa. London, Fed. Brit. Indus., Intel. Dept., 1920. 53 p. 241 titles, covering 1881-1920.
- PIERCE, FREDERICK T. The measurement of the mechanical properties of cotton materials. A summary of the literature. J. Text. Inst. 14: 181-182 (1923). 71 references.
- ROUX, F. C. La production du coton en Égypte. Paris, Colin, 1908. 410 p. Bibl., p. 401-405.
- URQUHART, A. R. Mechanical testing of cotton materials; the effect of humidity and temperature. J. Text. Inst. 14: 188 (1923). 24 references.
- WARD, J. S. M. Raw materials of industry: cotton and wool. London, Rider, 1921. 270 p. Cotton, p. 156-166; wool, p. 261-270.
- WOODBURY, CHARLES J. H. Bibliography of cotton manufacture. Trans. Nat. Assoc. Cotton Manfg., No. 86: 339-549; No. 88: 364-414 (1909-10). Reprinted in 2 vols. Waltham, Mass., Berry, 1909-1910. 6297 references. Classified: manufacture, finishing, bleaching, dyeing, engineering and machinery, history and economics, etc.

WORDEN, E. C. Cotton. *In his Technology of cellulose esters*, 1: 485-582. 565 references.

WORDEN, E. C. Preparation of cotton for esterification. *In his Technology of cellulose esters*, 1: 583-664. 508 references.

See also FIBERS.

COTTONSEED MEAL

- HALLIGAN, J. E. Cottonseed meal and hulls for feeding. *Feedingstuffs* 35: No. 3, 22-24; No. 6, 29-30; 36: No. 3, 25-26, 55-56; No. 4, 37-38, 55-56; No. 5, 47, 51; No. 6, 43-44, 48-49. 254 references.
- MCCANDLISH, ANDREW C. The use of cottonseed meal to increase the percentage of fat in milk. J. Dairy Sci. 4: 310-333 (1921). 60 references.
- MACY, ICIE G. Historical notes on cottonseed as a food. J. Dairy Sci. 4: 250-265 (1921). 40 references.
- NEVENS, N. B. Proteins of cottonseed meal. I. Amino acid content. II. Nutritive value. J. Dairy Sci. 4: 375-400, 552-588 (1921). 70 references. *Also Thesis*, Univ. Ill., 1921.
- COTTRELL PROCESS.** *See ELECTRICAL PRECIPITATION.*
- COUMARIN**
- DOHRN, M., and THIELE, A. Coumarin. *In Abderhalden, Biochem. Handl.* 1: 1278-1280 (1911). 50 footnotes.
- HESS, RUDOLF. Ueber die Einwirkung von Hydroxylamin auf Coumarin. Dissertation, Greifswald, 1912. 72 p. Bibl. footnotes.
- MEYER-JACOBSON. Coumarin. *In their Lehrb. org. Chem.* 2, pt. 1: 672-677 (1902). Bibl. footnotes.
- SIMONIS, H. Die Coumarine. Stuttgart, Enke, 1916. References as footnotes and as tables in text.
- COUMARONE**
- MEYER-JACOBSON. Coumaron. *In their Lehrb. org. Chem.* 2, pt. 3: 88-101 (1915). Bibl. footnotes.
- STOERMER, R. Synthesen und Abbaureaktionen in der Coumaronreihe. Ann. 312: 237-336; 313: 79-99 (1900). About 100 footnotes.
- See also RESINS.*
- COURIN.** *See LIPIDS.*
- CREATINE**
- BAUMANN, LOUIS. Creatin and creatinin. *In Barker, Endocrinology and metabolism* 3: 171-180; references, 5: 345-509 (1922).
- "Creatine and creatinine." Ind.-Cat. S. G. O., 1st ser., 3: 494 (1882); 2nd ser., 3: 1012 (1898); 3rd ser., 4: 268-270 (1923).
- HUNTER, ANDREW. Physiology of creatine and creatinine. *Physiol. Rev.* 2: 586-626 (1922). 218 references.

- MENDEL, L. B., and ROSE, WM. C. Rôle of carbohydrates in creatine-creatinine metabolism. *J. Biol. Chem.* 10: 251-253, 264, 270 (1911). 70 references.
- MEYER-JACOBSON. Kreatin. *In their* Lehrb. org. Chem. 1, pt. 2: 1420-1424 (1913). Bibl. footnotes.
- PRAYON, JOSEPH. Methoden zur Bestimmung des Kreatinins im Harne und Untersuchungen ueber Kreatininausscheidungen im Harne der Herbivoren. Dissertation, Bern, 1910. 46 p. Bibl. footnotes.
- RONA, PETER. Kreatin und Kreatinin. *In* Abderhalden, *Biochem. Handl.* 4: 790 (1911); 9: 192 (1915). 325 footnotes.
- SCHULZ, WILHELM. Der Verlauf der Kreatininausscheidung im Harn des Menschen mit besonderer Berücksichtigung des Einflusses der Muskelarbeit. *Arch. ges. Physiol.* 186: 171-172 (1921). 25 references.
- STEENBOCK, H., and GROSS, E. G. Creatinuria. I. Exogenous origin of urinary creatine. *J. Biol. Chem.* 36: 265 (1918). 36 references.
- ZEMPLÉN, GÉZA. Kreatin und Kreatinin. *In* Abderhalden, *Biochem. Handl.* 11: 250-270 (1924). Bibl. footnotes. *See also* AMINES; BASES, ORGANIC.
- CREATININE.** *See* CREATINE.
- CREATINURIA.** *See* CREATINE.
- CREOSOTE**
- BATEMAN, ERNST. Coal tar and water gas tar creosotes; their properties and methods of testing. U. S. Dept. Agr., Bull. No. 1036, 1922. 114 p. Bibl., p. 112-114.
- "Creosote." *Ind.-Cat. S. G. O.*, 1st ser., 3: 498-499 (1882); 2nd ser., 3: 1021-1022 (1898); 3rd ser., 4: 273 (1923).
- CRESOL**
- EINBECK, H. Kresole. *In* Abderhalden, *Biochem. Handl.* 1: 561-577 (1911). 300 footnotes. *See also* COAL TAR, PHENOLS.
- CRITICAL PHENOMENA**
- CENTNERSZWER, M. Ueber kritische Temperaturen der Lösungen. *Z. physikal. Chem.* 46: 427-501 (1903). Bibl. footnotes.
- DEJEAN, PIERRE. Méthodes et appareils utilisés pour la détermination des points critiques des métaux et alliages. *Chimie & Industrie* 9: 899-900 (1923). 62 references.
- FRIEDRICH, FRITZ. Critical phenomena in binary systems. *J. Am. Chem. Soc.* 35: 1866-1883 (1913). Bibl. footnotes.
- HEIN, PAUL. Untersuchungen ueber den kritischen Zustand. *Z. physik. Chem.* 86: 385-426 (1913-14). 80 footnotes.
- KUENEN, J. P. Die Zustandsgleichung der Gase und Flüssigkeiten und die Kontinuitätstheorie. Braunschweig, Vieweg, 1907. Bibl. throughout text.
- LANDOLT-BÖRNSTEIN. Kritische Data. *In their* Tabellen, 4th ed., 1912, p. 449-451; 5th ed., 1923, p. 265-266. About 200 references.
- PICKERING, S. F. Review of the critical constants of various gases. *J. Phys. Chem.* 28: 97-124 (1924). References through text. *See also* KINETIC THEORY.
- CROTONIC ACID**
- SCHMIDT, ERNST. Crotonsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1023-1028 (1911). 100 footnotes.
- CROTONIC ALDEHYDE**
- MEYER-JACOBSON. Crotonaldehyd. *In their* Lehrb. org. Chem. 1, pt. 1: 1004 (1907). 20 references.
- CRYOLITE.** *See* FLUORSPAR.
- CRYSTAL STRUCTURE**
- BIJVOET, J. M. X-ray investigation of the crystal structure of lithium and lithium hydride. *Rec. trav. chim.* 42: 859-903 (1923). Bibl. footnotes.
- EWALD, P. P. Kristalle und Röntgenstrahlen. Berlin, Springer, 1923. "Complete bibl."
- HALL, C. H., JR. X-ray analysis of crystal structure; a bibliography. *Bull. Md. Acad. Sci.* 2: 87-88, 91-92 (1922); 3: 15-16 (1923). 193 references.
- JOHNSEN, A. Die Anordnung der Atome in Kristallen. *Jahrb. Radioakt. Elektronik* 14: 52-129 (1917). 46 references.
- JOHNSEN, A. Fortschritte im Bereich der Kristallstruktur. *Ergeb. exakten Naturwiss.* 1: 294-297 (1922). 110 references.
- KARSEN, A. Investigation with X-rays of the structure of crystals of sodium bromate and sodium chlorate. *Rec. trav. chim.* 42: 904-930 (1923). Bibl. footnotes.
- LANDOLT-BÖRNSTEIN. Kristallstrukturen. *In their* Tabellen, 5th ed., 1923, 872-873.
- NEUBURGER, MAXIMILLAN C. Kristallbau und Röntgenstrahlen. *Sammlung chem. chem.-tech. Vorträge* 27: 465-468 (1924).
- STEINMETZ, H. [Chemical-crystallographic relationships.] *Fort. Mineral. Krist. Petrog.* 4: 5-30 (1924).
- WYCKOFF, RALPH W. G. The structure of crystals. New York, Chem. Cat. Co., 1924. 462 p. Bibl., p. 423-449. About 600 references.

CRYSTAL STRUCTURE—Cont'd

WYCKOFF, RALPH W. G. Survey of existing crystal structure data. *J. Franklin Inst.* 195: 549-552 (1923). 151 references.

CRYSTALLOGRAPHY

CHEMICAL SOCIETY. Crystallography and mineralogy. *In* Annual reports of the progress of chemistry, 1+. 1904 to date. Bibl. footnotes. Early volumes carried the title, "Mineralogical chemistry."

"Crystals and crystallization." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 298-299 (1923).

GROTH, P. *Chemische Krystallographie*. 5 vols. Leipzig, Engelmann, 1906-1919. Bibl. footnotes.

MELLOR, J. W. "Crystals and crystallization." *In his* *Inorg. theor. chem.* 1: 589-687 (1922). About 800 references.

TABLES ANNUELLES. *Cristallographie et Mineralogie*. 1: 537-588 (1910); 2: 616-647 (1911); 3: 426-444 (1912); 4: 1026-1091 (1913-16).

TUTTON, A. E. H. *Crystallography and practical crystal measurements*. 2nd ed. 2 vols. London, Macmillan, 1922.

Serial

Zeitschrift für Krystallographie. Leipzig, Engelmann. 1877-. "Auszüge" in each number.

CUBEB. *See* OLEORESINS.

CUMINIC ALDEHYDE

WITTE, E. *p*-Cuminaldehyd. *In* Abderhalden, *Biochem. Handl.* 1: 821-823 (1911). 45 references.

CUPFERRON

BRALEY, S. A. Bibliography on the use of cupferron as a quantitative reagent. *J. Ind. Eng. Chem.* 11: 1144-1145 (1919). 13 references.

LUNDELL, G. E. F., and KNOWLES, H. B. The use of cupferron in quantitative analysis. *J. Ind. Eng. Chem.* 12: 344-350 (1920). Bibl. footnotes.

MARVEL, C. S., and KAMM, O. Use of cupferron in analytical chemistry. *J. Am. Chem. Soc.* 41: 277 (1919). 14 references.

POULENC FRERES. *Emplois du cupferron*: bibliographie. n. d.

SCHRODER, —. Verwendung des Cupferrons in der quantitativen Analyse. *Z. anal. Chem.* 61: 66 (1923). 29 references.

CUPRAMMONIUM SALTS

HORN, DAVID N. Some cuprammonium salts. *Am. Chem. J.* 35: 271-286 (1906); 37: 467-483 (1907); 38: 475-489 (1907); 39: 184-226 (1908). 90 footnotes.

MELLOR, J. W. Cupric ammino-oxides. *In his* *Inorg. theor. chem.* 3: 151-153 (1923). 50 references.

See also COMPLEX SALTS.

CURARE

"Curare." *Ind.-Cat. S. G. O.*, 1st ser., 3: 561-562 (1882); 2nd ser., 3: 1079 (1898); 3rd ser., 4: 306 (1923).

CYANAMIDE

MEYER-JACOBSON. Cyan-amide. *In their* *Lehrb. org. Chem.* 1, pt. 2: 1322-1328 (1913). Bibl. footnotes.

CYANIC ACID

MEYER-JACOBSON. Cyansäure. *In their* *Lehrb. org. Chem.* 1, pt. 2, 1287-1292 (1913). Bibl. footnotes.

CYANIDES

GUTHRIE, A. Cyanide. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 719-749 (1911). References through text.

JURISCH, K. W. Cyanide. *In his* *Salpeter und sein Ersatz*, 1908, p. 272-293. Covers 1843-1908.

MEYER-JACOBSON. Salze des Blausäure. *In their* *Lehrb. org. chem.* 1, pt. 2: 1270-1281 (1913). Bibl. footnotes.

CYANIDE PROCESS

MACFARREN, H. W. *Textbook of cyanide practice*. New York, McGraw, 1912. 291 p. Classified bibl., p. 215-268. 1000 references.

MILLS, H. D. The cyanide process: articles on coarse and fine grinding, solution of gold and silver and filtration. *Trans. Intern. Congr.*, 1915, Metal., p. 355-360. 130 references.

ROBINE, R., and LENGLEN, M. Cyanide industry theoretically and practically considered. New York, Wiley, 1906. 408 p. Bibl., p. 331-401. 500 patents.

THOMSON, FRANCIS A. *Stamp milling and cyaniding*. New York, McGraw, 1915, 285 p. Bibl. at ends of chapters.

CYANOACETIC ACID

MEYER-JACOBSON. Cyan-essigsäure. *In their* *Lehrb. org. Chem.* 1, pt. 2: 343-346 (1913). Bibl. footnotes.

CYANOGEN

BERTELSMANN, W. Cyan und seine Verbindungen. *In* Bräuer und d'Ans, *Fortschritte*, 1: 1941-1947 (1922). German patents.

CLENNELL, J. E. Recent advances in the chemistry of the cyanogen compounds. *Trans. Am. Inst. Mining Eng.* 54: 504-505 (1916). 35 references, mostly patents.

HÉBERT, A. Cyanogène. *In* Moissan, *Chem. min.* 2: 321-328 (1905). 79 footnotes.

JOANNIS, M. Cyanogène. *In* Frémy, *Enc. chim.* 2, 2^e cahier: 271-272, 302-303, 486-487 (1885).

KOHLER, HIPPOLYT. Die Industrie der Cyanverbindungen. Braunschweig, Vieweg, 1914. 200 p. Bibl. footnotes.

MEYER-JACOBSON. Cyan. *In their* Lehrb. org. Chem. 1, pt. 2: 1256-1260 (1913). Bibl. footnotes.

WALLIS, THEODOR. Ueber die Synthese des Cyans und Cyanwasserstoffs aus den Elementen. *Ann.* 345: 353-362 (1906). 38 footnotes.

WEIGERT, —. Cyan. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 253-276 (1909). 40 references.

CYANOGEN CHLORIDE

JENNINGS, W. L., and SCOTT, W. B. Preparation of cyanogen chloride. *J. Am. Chem. Soc.* 41: 1241-1248 (1919). Bibl. footnotes.

CYANURIC ACID

MEYER-JACOBSON. Cyanursäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1330-1335 (1913). Bibl. footnotes.

CYCLOHEXANE

MEYER-JACOBSON. Cyclohexan. *In their* Lehrb. org. Chem. 2, pt. 1: 784-800 (1902). Bibl. footnotes.

See also HYDROCARBONS.

CYMENE

BAUM, FRITZ. *p*-Cymol. *In* Abderhalden, *Biochem. Handl.* 1: 301-312 (1911). 105 references.

See also CYSTEINE.

CYSTINE

ABDERHALDEN, EMIL. Die schwefelhaltigen Abbauprodukte der Eiweisskörper und deren Konstitution. *Biochem. Centr.* 2: 257-262 (1903). 32 references.

"Cystine and cystinuria." *Ind.-Cat. S. G. O.*, 1st ser., 3: 575 (1882); 2nd ser., 3: 1096 (1898); 3rd ser., 4: 317-318 (1923).

HOFFMAN, WALTER F., and GORTNER, R. A. The effect of acid hydrolysis upon cystine. *J. Am. Chem. Soc.* 44: 341-360 (1922). 25 footnotes.

MEYER-JACOBSON. Cystin. *In their* Lehrb. org. Chem. 1, pt. 2: 794-798 (1913). Bibl. footnotes.

ZEMPLÉN, GÉZA. Cystin. *In* Abderhalden, *Biochem. Handl.* 4: 648-659 (1911); 9: 129-130 (1915). About 200 footnotes.

See also AMINO ACIDS.

CYSTINURIA

KAHN, MAX, and ROSENBLUM, J. Cystinuria. *In* Barker, *Endocrinology and metabolism* 4: 515-539; references, 5: 511-694 (1922).

ROSENFELD, GEORG. Die Cystinurie. *Ergeb. Physiol.* 18: 118-121 (1920). 160 references.

See also CYSTINE.

CYTOSINE. See PYRIMIDINES.

DAIRY PRODUCTS

BROSCH, A. [Bibliography of dairy literature.] *Mitt. deut. Milchw. Ver.* 31: 223-233 (1914). Covers the year 1914.

GRIMMER, W. Bericht über die Arbeiten auf dem Gebiete der Milchchemie und des Molkereiwesens. *Milchw. Zentr.* 4: 57-74, 337-351 (1908); 325 references. 5: 49-67, 377-393 (1909); 343 references; 6: 97-113, 337-352 (1910); 337 references. 7: 49-70, 337-361 (1911); 347 references. 42: 139-140, 178-185 (1913); 165 references. 43: 482, 499, 513, 530, 551, 569 (1914); 44: 3, 17, 33 (1915); 293 footnotes. 47: 25, 38, 61, 73, 97, 121, 133, 145, 158, 169, 182, 193, 205, 218, 229, 242, 253, 267, 297 (1918); 48: 2, 13, 25 (1919). 560 footnotes.

MONJONNIER, TIMOTHY, and TROY, H. C. The technical testing of dairy products; treatise on the testing, analyzing, standardizing and manufacturing of dairy products. Chicago, Monjonniere, 1922. 909 p. References at ends of chapters.

PALMER, LEROY S. Chemistry of milk and dairy products viewed from a colloidal standpoint. *Ind. Eng. Chem.* 16: 635 (1924). 33 references.

RAUDNITZ, R. W. [Investigation on dairy science and dairy practices in the years 1907-1909.] *Monatschr. Kinderheilk.* 6: No. 6, 43 p.; No. 11, 36 p. (1907); 7: No. 7, 46 p. (1908); 8: No. 5, 64 p. (1909); 9: No. 2, 51 p. (1910)."

RAUDNITZ, R. W., and GRIMMER, W. [Bibliography of dairy literature.] *Arb. Ges. Milchw. u. Molk Praxis*, 1: No. 17, 40 p. (1913). Bibl. for 1913.

See also BUTTER, CHEESE, MILK, ETC.

DAKIN'S SOLUTION

"Dakin's solution." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 327-328 (1923).

See also ANTISEPTICS, CHLORAMINE.

DATOLITE

GORGEY, R., and GOLDSCHMIDT, V. Über Datolith. *Z. Kryst.* 48: 619-621 (1911). 68 references.

DEHYDROACETIC ACID

HALE, WM. J. Constitution of dehydroacetic acid. *J. Am. Chem. Soc.* 33: 1119 (1911). 30 references.

MEYER-JACOBSON. Dehydracetsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1184 (1913). 45 references.

DEHYDROTHIOTOLUIDINE

MEYER, MARTIN. Dehydrothiotoluidine: its isomers, homologues, analogues and derivatives. Dissertation, Columbia Univ., 1921. 48 p. Bibl., p. 46-47. 82 references.

DEHYDROTHIOTOLUIDINE—*Cont'd*

MEYER-JACOBSON. Dehydro-thiotoluidin. *In their* Lehrb. org. Chem. 2, pt. 3: 556-558 (1916). Bibl. footnotes.

DENITRIFICATION

LUMIA, C. Il processo di denitrificazione nel terreno agrario e l'arrabbiaticcio e calda-fredda. *Ann. chim. appl.* 4: 52-55 (1915). Covers 1846-1914.

VOORHEES, E. B. Denitrification. *J. Am. Chem. Soc.* 24: 785-804 (1902). 80 references.

DENSITY

BAXTER, G. B., *et al.* Densities and cubical coefficients of expansion of various halogen salts. *J. Am. Chem. Soc.* 38: 259-271 (1916).

CLARKE, FRANK W. A table of specific gravities for solids and liquids. Constants of nature, pt. 1. Rev. ed. New York, Macmillan, 1888. 408 p. Values for 5227 substances with references.

KAHLBAUM, GEORGE A., and STURM, E. Ueber die Veränderlichkeit des spezifischen Gewichtes. *Z. anorg. Chem.* 46: 217-310 (1905). Bibl. footnotes.

LANDOLT-BÖRNSTEIN. Spezifische Gewichte der chemischen Elementen. *In their* Tabellen, 4th ed., 1912, p. 162-168; 5th ed., 1923, p. 284-291. Spezifische Gewichte fester und flüssiger anorganischer Verbindungen. *Ibid.* 4th ed., 169-189; 5th ed., 292-313. Spezifisches Gewicht wässriger Lösungen. *Ibid.* 4th ed., 279-282; 5th ed., 413-417. Spezifische Gewicht Lösungen von Salzen sowie von anorganischen Säuren und Basen. *Ibid.* 5th ed., 433-437. Spezifische Gewicht organischer Säuren. *Ibid.* 5th ed., 447. Spezifische Gewicht von Lösungen der Alkohole, der Zuckerarten und anderer organischen Stoffen, sowie von Kolloiden. *Ibid.* 5th ed., 470-472. Spezifische Gewichte, Ausdehnung und Kontraktionen von Gemische. *Ibid.* 5th ed., 473-476.

TABLES ANNUELLES. Densités. 1: 4-30 (1910); 2: 3-21 (1911); 3: 5-32 (1912); 4: 8-61 (1913-16).

DENTAL CEMENTS

VOELKER, CHARLES C. Dental silicate cements in theory and practice. *Dental Cosmos* 58: 1098-1111 (1916).

DENTAL CHEMISTRY

GIBSON, CHARLES S. The chemistry of dental materials. London, Benn, 1922. 176 p. Bibl. footnotes.

DESMIN

DOELTER, C. Desmin. *In his* Handb. Mineralchem. 2, pt. 3: 152-170 (1921). Bibl. footnotes.

DESMOTROPY

DIMROTH, OTTO. Ueber desmotrope Verbindungen. *Ann.* 335: 1-111 (1904). 82 footnotes.

MICHAEL, ARTHUR. Ueber Desmotropie und Merotropie. *Ann.* 363: 20, 36, 64, 94 (1908); 364: 64, 129 (1908). About 200 footnotes.

DETONATORS. *See* EXPLOSIVES.**DEXTRINS**

CZAPEK, F. Dextrine. *In his* Biochemie der Pflanzen, 1: 348-353; 2: 961-962 (1905).

MEYER-JACOBSON. Dextrine. *In their* Lehrb. org. Chem. 1, pt. 2: 1033 (1913).

TOLLENS, B. Dextrine. *In his* Handb. der Kohlenhydrate, 2nd ed., 1: 177-182, 191-193; 2: 210-215 (1898).

WOLF, R. M. Stärke und Dextrin. *Chem. App.* 3: 52-54 (1916). Patents.

ZEMPLÉN, GÉZA. Dextrine aus Stärke, Glykogen, usw. *In* Abderhalden, Biochem. Handl. 2: 161-184 (1911); 8: 41-46 (1914); 10: 263-275 (1923). Bibl. footnotes.

See also STARCH.

DEXTROSE. *See* GLUCOSE.**DIABETES**

ALLEN, FREDERICK M. Glycosuria and diabetes. Boston, Leonard, 1913. 1179 p. Bibl., p. 1111-1179. Alphabetical by author.

ALLEN, FREDERICK M. The rôle of fat in diabetes. *In* Harvey Lectures, 1916-1917, p. 104-111. 125 references.

ALLEN, FREDERICK M. Experimental studies in diabetes. IV. Lipemia. *J. Metabolic Res.* 2: 244-298 (1922). 377 references, annotated.

ALLEN, F. M., and SHERRILL, J. W. Diet treatment of diabetes insipidus. *J. Metabolic Res.* 3: 479-510 (1923).

"Diabetes, chemistry of." *Ind.-Cat. S. G. O.*, 1st ser., 3: 731-732 (1882); 2nd ser., 4: 199-200 (1899); 3rd ser., 4: 472-473 (1923).

"Diabetes, elimination of sugar in." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 481-482 (1922).

MCGUIGAN, HUGH. Sugar metabolism and diabetes. *J. Lab. Clin. Med.* 3: 319-337 (1918). 70 references.

KAHN, MAX and M. H. The lime deficiency of diabetes. *Arch. Inter. Med.* 18: 212-227 (1916). 50 footnotes.

NOORDEN, CARL VON. Diabetes mellitus. *In his* Handb. der Pathologie des

Stoffwechsels 2: 113-137 (1907). 399 references.

WOODYATT, R. T. Diabetes. *In* Wells, Chemical pathology, 4th ed., p. 642-678 (1920). 80 footnotes.

WOODYATT, R. T. Pathological metabolism of diabetes mellitus. *In* Barker, Endocrinology and metabolism, 4: 263-287; references, 5: 511-694 (1922).

DIACETYLATION

DUBSKY, J. V. Ueber Diacetylierungsmethoden. *Chem.-Ztg.* 36: 677-678, 697-699 (1912). 46 footnotes.

DIACETILSUCCINIC ACID

MEYER-JACOBSON. Diacetbernsteinsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1208 (1913). 36 references.

DIAMOND

BOUTAN, E. Diamant. *In* Frémy, Enc. chim. 2, pt. 2: 314-320 (1886).

DOELTER, C. Diamant. *In his* Handb. Mineralchem. 1: 28-56 (1912). Bibl. footnotes.

FERSMANN, A. von., and GOLDSCHMIDT, V. Der Diamant. Heidelberg, 1911. 274 p. Bibl., p. 42-58. 402 references.

GUTHRIE, A. Diamant. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 473, 488-497 (1911). References through text.

KRAUSS, F. Ueber die künstliche Darstellung von Diamanten. *Brennstoff-Chemie* 5: 113-121, 133-136 (1924). Bibl. footnotes.

KUNTZ, GEORGE F. Diamond and moissanite, natural, meteoric and artificial. *Trans. Am. Electrochem. Soc.* 12: 39-63 (1907). 52 footnotes.

MELLOR, J. W. Synthesis and genesis of diamonds. *In his* Inorg. theor. Chem. 5: 737-738 (1924).

MOHR, ERNST. Die Baeyersche Spannungstheorie und die Struktur des Diamanten. *J. prakt. Chem.* 206: 315-353 (1918). Bibl. footnotes.

MOISSAN, H. Diamants. *In his* Chim. min. 2: 188-218 (1905). 190 footnotes.

See also CARBON, PRECIOUS STONES.

DIASTASE

"Diastase." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 545-547 (1923).

DIEDERICH, ÉMILE. Chimie pastorienne. L'action diastasique dans les fermentations industrielles. Paris, Roussel, 1906. 181 p. Bibl., p. 12-19.

GEYELIN, H. R. A clinical study of amylase in the urine. *Arch. Int. Med.* 13: 96-120 (1904). 45 footnotes.

HAWKINS, LON A. Effect of certain chlorides, singly and combined in pairs, on the activity of malt diastase. *Bot. Gaz.* 55: 265-285 (1913). 30 footnotes.

McCLURE, C. W., and PRATT, J. H. A study of the diastatic activity of urine and feces with special reference to diseases of the pancreas. *Arch. Inter. Med.* 19: 568-592 (1917). 39 footnotes.

ROBBINS, WM. J. Influence of certain salts and nutrient solutions on the secretion of diastase by *Penicillium camembertii*. *Am. J. Bot.* 3: 234-260 (1916). 24 references.

TALIANA, GIULIO, and TAGLIANI, GIOVANNI. [Transformation and elimination of thickening agents fixed upon cotton fibers.] *Rev. gen. mat. color.* 11: 34-46 (1907).

THOMAS, P. [Diastases. Methods of research and progress made.] *Bull. Inst. Pasteur* 7: 41-52, 89-100, 137-152 (1909).

See also ENZYMES.

DIATOMACEOUS EARTH

GOODWIN, NORRIS. Diatomaceous earth. *Chem. Met. Eng.* 23: 1159-1160 (1920). 150 references, including patents.

DIAZO COMPOUNDS

CAIN, JOHN C. The chemistry and technology of the diazo compounds. 2nd ed. London, Arnold, 1920. 199 p. Bibl. footnotes with name index.

HANTZSCH, A. Die Diazoverbindungen. Sammlung chem. chem.-tech. Vorträge 8: 1-82 (1902). Bibl. footnotes.

MARVEL, CARL S. A study of the possible symmetry of the aliphatic diazo compounds. *J. Am. Chem. Soc.* 42, 2259-2278 (1920). Thesis, Univ. Ill., 1920. Bibl. footnotes.

MEYER-JACOBSON. Diazokörper und Hydrazine, sowie ihre Abkömmlinge. *In their* Lehrb. org. Chem. 2, pt. 1: 277-303 (1896).

DIAZOAMINO COMPOUNDS

MEYER-JACOBSON. Diazoamido Verbindungen. *In their* Lehrb. org. Chem. 2, pt. 1: 277-303 (1895). Bibl. footnotes.

DIBENZYL

MEYER-JACOBSON. Dibenzyl. *In their* Lehrb. org. Chem. 2, pt. 2: 190 (1903).

See also HYDROCARBONS.

DIBROMOSUCCINIC ACID

MEYER-JACOBSON. Dibromobernsteinsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 524 (1913). 44 references.

DICHLOROACETIC ACID

MEYER-JACOBSON. Dichloressigsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 496 (1913). 31 references.

DICHLORODIETHYL SULFIDE. *See* MUSTARD GAS.

DIDYMIUM

LANGMUIR, A. C. Index to the literature of didymium, 1842-1893. Smithsonian Misc. Coll., No. 972 (Vol. 38, No. 4), 1894. 17 p. Also in *School of Mines Quart.* 15, No. 1. Chronological.

See also RARE EARTHS.

DIELECTRICS

GÜNTHER-SCHULZE, A. Die dielektrische Festigkeit von Flüssigkeiten und festen Körpern. *Jahrb. Radioakt. Elektronik* 19: 111-112 (1922). 24 references, 1879-1914.

LATTEY, R. T. The dielectric constants of electrolytic solutions, *Phil. Mag.* (6) 41: 847-848 (1921). 62 references.

MATHEWS, JOSEPH H. The relation between electrolytic conduction, specific inductive capacity and chemical activity of certain liquids. *J. Phys. Chem.* 9: 667-681 (1905). About 250 references.

SMYTH, CHARLES P. The electric moments of typical organic molecules. *J. Am. Chem. Soc.* 46: 2151-66 (1924). 37 footnotes.

DIET

BRYCE, ALEX. Modern theories of diet and their bearing upon practical dietetics. London, Arnold, 1912. 368 p. *Bibl.*, p. 343-350.

"Diet." *Ind.-Cat. S. G. O.*, 1st ser., 3: 773-778 (1882); 2nd ser., 4: 261-273 (1899); 3rd ser., 4: 557-564 (1923).

FITCH, WM. EDWARD. *Dietotherapy*. 2nd ed. New York, Appleton, 1922. 3 vols. Contains bibls.

FOLENA, U. Esperienze sul minimo di azoto nella razione alimentare normale in regime di riposo et de lavoro. *Ann. Ig. Sper.*, n. s., 22: 393-396 (1912).

GREENWALD, ISIDOR. A normal diet. *In* Barker, *Endocrinology and metabolism* 3: 359-421; references, 5: 345-509 (1922).

STRAEHLIN, R. Untersuchungen über vegetarischen Diät mit besonderer Berücksichtigung des Nervensystems, der Blutzirkulation und der Diurese. *Z. Biol.* 49: 251-282 (1907). 232 references.

See also FOOD, METABOLISM, NUTRITION, ETC.

5, 5-DIETHYLBARBITURIC ACID. *See* VERONAL.

DIFFUSION

DESCH, CECIL H. Report on diffusion in solids. *Rept. Brit. Assoc. Adv. Sci.*, 1912: 348-372. 173 references.

DIGGS, STEKLING H. Influence of the concentration of potassium iodide on the rate of diffusion of iodine in

potassium iodide solutions. *Univ. Va. Pub., Bull. Phil. Soc., Sci. ser.* 1: 477-512 (1914). *Bibl.*, p. 509-512.

LANDOLT-BÖRNSTEIN. *Diffusion. In their Tabellen*, 4th ed., 1912, p. 138-139; 5th ed., 1923, 251-252.

SCHLEUSSNER, CARL A. Diffusionvorgänge in Gelatine. *Kolloid-Z.* 31: 348-349 (1922). 53 references.

See also COLLOIDS.

DIGESTION

"Alimentation." *Ind.-Cat. S. G. O.*, 1st ser., 1: 192 (1880); 2nd ser., 1: 253-255 (1896); 3rd ser., 1: 290-292 (1918).

COHNHEIM, OTTO. Die Bedeutung des Dünndarm für die Verdauung. *Biochem. Centr.* 1: 169-178 (1902). 128 references.

COHNHEIM, OTTO. Die Physiologie der Verdauung und Aufsaugung. *In* Nagel, *Handb. der Physiologie des Menschen*, 2: 516-665 (1907). *Bibl. footnotes*.

"Digestion." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 568-573 (1923).

FITCH, WM. EDWARD. *Dietotherapy*. Chemistry and physiology of digestion. Classification and analysis of foods. 2nd ed. New York, Appleton, 1922. Vol. 1. 816 p. Contains bibls.

LONDON, E. S. Neuere Forschung auf dem Gebiete der Verdauung und der Resorption von Nahrungsstoffen. *In* Oppenheimer, *Handb. Biochem., Ergänzungsband*, 405-432 (1913). 126 footnotes.

NOLL, A. Die Sekretion der Drüsenzelle. I. Verdauungsdrüsen. *Ergeb. Physiol.* 4: 88-97 (1905). 250 references.

SCHAEUNERT, ARTHUR. Verdauung der Wirbeltiere. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 5: 56-160 (1924). 405 footnotes.

SCHULZ, FR. N. Verdauung und Resorption der Wirbellosen Tiere. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 5: 1-55 (1924). 323 footnotes.

DIGIFOLIN

"Digifolin." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 581 (1923).

MEIER, HANS. Digifolin, ein neues digitalis Präparat und seine Wirkung beim Pferde. *Dissertation*, Bern, 1919. 60 p. *Bibl.*, p. 58-60.

See also DIGITALIS.

DIGITALIS

"Digitaline." *Ind.-Cat. S. G. O.*, 1st ser., 3: 786-787 (1882); 2nd ser., 4: 286 (1899).

"Digitalis." *Ind.-Cat. S. G. O.*, 1st ser., 3: 787-791 (1882); 2nd ser., 4: 287-288 (1899); 3rd ser., 4: 582-589 (1923).

"Digitalic glucosides and allied drugs." *In* Merck's Annual report, 25: 31-129 (1911). Bibl. footnotes.

HAMILTON, HERBERT C. The biologic methods for digitalis assay. *Am. J. Pharm.* 92: 529-537 (1920).

KILIANA, H. Digitalis glucosides. *Arch. Pharm.* 254: 255-295 (1916). Bibl. footnotes.

MAMELI, EFISIO. Sull' estrazione dei principi attivi dalle foglie di digitale. *Giorn. chim. ind. appl.* 4: 355-358 (1922). 33 footnotes.

RISING, A., and LUNDBERG, J. Digitalisglucoside. *In* Abderhalden, *Biochem. Handl.* 2: 651-657 (1911). Bibl. footnotes.

ROBINSON, G. CANBY. The therapeutic use of digitalis. *Medicine* 1: 130-137 (1922). 163 references.

ZEMPLÉN, GÉZA. Digitalisglucoside. *In* Abderhalden, *Biochem. Handl.* 8: 342 (1914); 10: 861-879 (1923). Bibl. footnotes.

DIGITONIN

ROBERT, K. Digitonin. *In* Abderhalden, *Biochem. Handl.* 7: 151-155 (1912). 45 footnotes.

DIKETONES

MEYER-JACOBSON. Diketone. *In* their *Lehrb. org. Chem.* 1, pt. 2: 823-845 (1913). Bibl. footnotes.

RABE, PAUL, and ELZE, FRITZ. Zur Kenntniss des 1, 5-Diketone. *Ann.* 323: 83-112 (1902). 40 footnotes.

STOBBE, HANS. Studien über Tautomerie, insbesondere an einem semicyklischen 1, 3-Diketon der Penta-methylenreihe. *Ann.* 326: 347-370 (1903). 65 footnotes.

See also KETONES.

DIKETOPIPERAZINE

MEYER-JACOBSON. Dioxopiperazin. *In* their *Lehrb. org. Chem.* 2, pt. 3: 1356-1365 (1920). Bibl. footnotes.

DILUTION LAW

KENDALL, JAMES. Extension of the dilution law to concentrated solutions. *J. Am. Chem. Soc.* 36: 1069-1088 (1914). Bibl. footnotes.

PARTINGTON, J. R. Some recent investigations on the dilution law. *Trans. Farad. Soc.* 15: 96-121 (1919). Bibl. footnotes.

WEGSCHEIDER, RUD. Ueber die Anomalie der starken Elektrolyte und die Gültigkeitsgrenzen des Verdünnungsgesetzes. *Z. physik. Chem.* 69: 603-629 (1909). Bibl. footnotes.

DIMETHYL SULFATE

LYNN, E. V., and SHOEMAKER, H. A. Laboratory preparation of dimethyl sulfate. *J. Am. Chem. Soc.* 46: 999 (1924). 22 references.

DINAPHTHAZINE

MEYER-JACOBSON. Die Dinaphthazin Systeme. *In* their *Lehrb. org. Chem.* 2, pt. 3: 1435-1439 (1920). Bibl. footnotes.

DINITROPARAFFINS

MEYER-JACOBSON. Dinitroderivate der Grenzkohlenwasserstoffe. *In* their *Lehrb. org. Chem.* 1, pt. 2: 213-217 (1913). Bibl. footnotes.

DIOPSID. See CALCIUM SILICATES.

DIPHENYL. See BIPHENYL.

DIPHENYLKETENE

STAUDINGER, HERMANN. Diphenylketen. *Ann.* 356: 51-123 (1907). 118 footnotes.

DIPHENYLMETHANE

MEYER-JACOBSON. Diphenylmethan. *In* their *Lehrb. org. Chem.* 2, pt. 2: 80 (1903). 17 references.

DISINFECTANTS

CHICK, H., and MARTIN, C. J. The principles involved in the standardization of disinfectants and the influence of organic matter upon germicidal value. *J. Hyg.* 8: 695-697 (1908). 37 references.

"Disinfectants and disinfection." *Ind.-Cat. S. G. O.*, 1st ser., 3: 841-847 (1882); 2nd ser., 4: 395-413 (1899); 3rd ser., 4: 643-659 (1923).

DÜRING, E. A. FRANZ. Übersicht über die deutschen Reichspatente betreffend "Heilmittel und Desinfektionsmittel." 1908. 116 p. Patents, arranged numerically, without index.

ENGLAND, JOSEPH W. The phenol coefficient method of testing disinfectants. *J. Am. Pharm. Assoc.* 2: 955-958 (1913).

GOTSCHLICH, E. Desinfektion. *In* Kolle and Wassermann, *Handb. der pathogenen Mikroorganismen*, 4, pt. 1: 179-265 (1904). Bibl. through text. 600 references.

LAUBENHEIMER, KURT. Phenol und seine Derivate als Desinfektionsmittel. Dissertation, Giessen, 1909. 156 p. Bibl., p. 147-156.

MOLL, THEODOR. Untersuchungen ueber die Wirksamkeit einiger chemischer Desinfektionsmittel auf Tetanus-sporen. Jena, Fischer, 1920. 37 p. Bibl., p. 36-37.

REISCHAUER, A. [Comparative experiments on the reliability of different methods of disinfecting by means of formaldehyde.] *Hyg. Rundschau* 11: 636-655 (1901).

RIDEAL, S., and RIDEAL, E. K. Chemical disinfection and sterilization. London, Arnold, 1921. 313 p. Bibl. at end of chapters.

SCHMITT, HANS. Kritische Zusammenfassung der Arbeiten über Hitzdes-

DISINFECTANTS—Cont'd

infektion aus den Jahren 1914 bis 1919. *Ergeb. Hyg.* 4: 324-328 (1920). 136 references.

SHIPPEN, LLOYD P. Pine oil and pine distillate product emulsions; methods of production, chemical properties and disinfectant action. *U. S. Dept. Agr., Bull. No. 989*, 1921. 16 p. Bibl., p. 15-16.

TILLEY, F. W. Phenol coefficients. *Am. J. Pub. Health*, 11: 513-519 (1921). 16 references.

WEISS, JOHN M. References to the recent work on the standardization of disinfectants. *J. Franklin Inst.* 175: 625 (1913). 22 references.

See also ANTISEPTICS; BOOKS, DISINFECTION; GERMICIDES.

DISPERSION

PFLUGER, A. Dispersion. *In* Kayser, Handb. der Spectroscopie 4: 247-595 (1908). Bibl. footnotes.

DISSOCIATION

NEF, J. U. Dissociationvorgänge bei den Alkyläthern der Salpetersäure, der Schwefelsäure und der Halogenwasserstoffsäuren. *Ann.* 318: 1-57 (1902). 80 footnotes.

NEF, J. U. Dissociationvorgänge bei den einatomigen Alkoholen, Aethern und Salzen. *Ann.* 318: 137-230 (1902). 90 footnotes.

NEF, J. U. Dissociationvorgänge in der Glycol-Glycerin Reihe. *Ann.* 335: 191-333 (1904). 164 footnotes.

NEF, J. U. Dissociationvorgänge in der Zuckergruppe. *Ann.* 403: 204-383 (1913). Bibl. footnotes.

See also ELECTROLYTIC DISSOCIATION.

DISTILLATION

ROBINSON, CLARK S. The elements of fractional distillation. New York, McGraw, 1922. 205 p. Bibl., p. 174-200.

YOUNG, SYDNEY. Distillation principles and processes. London, Macmillan, 1922. 509 p. Bibl. footnotes.

See also VAPOR PRESSURE.

DISTILLED LIQUORS. *See* BEVERAGES, WINES, ETC.

DITHIONIC ACID

LINNE, BR. Dithionsäure, $H_2S_2O_6$. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 593-599 (1907). References through text.

DIURETICS

"Diuretics and diuresis." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 693-694 (1923).

DOLOMITE

EPHRAIM, FRITZ. Dolomit. Calcium-magnesiumkarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 510-512 (1909).

LEITMEIER, H. Dolomit. *In* Doelter, Handb. Mineralchem. 1: 360-402 (1912). Bibl. footnotes.

LINCK, G. Die Experimente zur Darstellung des Dolomits. Hypothesen ueber die Entstehung des Dolomits. *In* Doelter, Handb. Mineralchem. 1: 136-138 (1912). 120 references.

DRUGS

"Blood, effect of drugs on." *Ind.-Cat. S. G. O.*, 2nd ser., 2: 455 (1897); 3rd ser., 3: 63-64 (1922).

COHN, PAUL. Die Verwendung von Chemikalien als Heilmittel. Sammlung chem. chem.-tech. Vorträge 10: 411-500 (1905). Bibl. footnotes.

"Drugs, adulteration of." *Ind.-Cat. S. G. O.*, 1st ser., 3: 915-916 (1882); 2nd ser., 4: 512-514 (1899); 3rd ser., 4: 741-745 (1923).

FRÄNKEL, SIGMUND. Die Arzneimittel-Synthese auf Grundlage der Beziehungen zwischen chemischen Aufbau und Wirkung für Ärzte, Chemiker und Pharmazeuten. Berlin, Springer, 1921. 906 p. Bibl. footnotes.

KLUTE, HERMANN. Zinkperhydrol, Zincum Peroxygenatum und Magnesiumperhydrol. Vergleichende Untersuchungen über ihre Verwendbarkeit in der Veterinarmedizin an Stelle des Perhydrols. Dissertation, Bern, 1910. 48 p. Bibl., p. 44-48.

LLOYD, JOHN U. History of the vegetable drugs of the Pharmacopeia of the U. S. Lloyd Library, Bull. No. 18 (Pharm. Ser. No. 4), 1911. 235 p. Bibl., p. 94-105.

LLOYD, JOHN U. Origin and history of all the pharmacopoeial vegetable drugs, chemicals and preparations, with bibliography. I. Vegetable drugs. Washington, Am. Drug Mfr. Assoc., 1922. 356 p. Bibl., p. 357-424.

MAY, PERCY. The chemistry of synthetic drugs. 3rd ed. London, Longmans, 1921. 248 p. Bibl. footnotes.

ROSENMUND, K. W. Arzneimittelwesen. Fortschritte Chem. 14: 179-192 (1918-19). References through text.

SALANT, WM. The action of drugs under pathological conditions. *U. S. Dept. Agr., Bur. Chem., Circ. No. 81*, 1911. 16 p. Bibl., p. 15-16.

SPIEGEL, LEOPOLD. Chemische Konstitution und physiologische Wirkung. Sammlung chem. chem.-tech. Vorträge 14: 289-384 (1909). Bibl. footnotes.

TSIRCH, A. [Origin of plant and drug names.] *Schweiz. Apoth.-Ztg.* 57: 471-476, 491-496, 507-513, 519-525, 531-535, 543-549 (1919). Bibl. footnotes.

DRUGS: Deterioration.

EBERHARDT, E. G., and ELDRED, F. R. Bibliography of the deterioration of drugs and pharmaceutical products. *Lilly Sci. Bull.*, ser. 1, No. 5: 181-193 (1914); *J. Am. Pharm. Assoc.*, 3: 38-49 (1914). Arranged alphabetically by drugs. "Fair review of the field."

DRUGS: Tolerance.

GUNN, J. A. Cellular immunity: congenital and acquired tolerance to non-protein substances. *Physiol. Rev.* 3: 41-74 (1923). 101 references.

DRYING

ALLIOTT, EUSTACE A. Bibliography of chemical engineering subjects, 1900-1923. *In* *Trans. Inst. Chem. Engr.* (English) 1: 109-120 (1923). Filtration, p. 109-115; centrifugal dryers and separators, p. 116-120.

MARLOW, THOMAS G. Drying machinery and practice. London, Lockwood, 1910. 326 p. Bibl., p. 279-288.

DRYING OILS. *See* OILS; VARNISHES (Morrell).**DULCITOL**

MEYER-JACOBSON. Dulcit. *In their* *Lehrb. org. Chem.* 1, pt. 2: 188 (1913). 30 references.

NEUBERG, C., and REWALD, B. Dulcit. *In* *Abderhalden, Biochem. Handl.* 2: 447-449 (1911); 8: 237-238 (1914). 60 references.

ZEMPLÉN, GÉZA. Dulcit. *In* *Abderhalden, Biochem. Handl.* 10: 661-667 (1923). Bibl. footnotes.

DURALUMINIUM

FRAENKEL, W., and SCHERRER, E. Das Duraluminproblem. *Naturwissenschaften* 12: 145-148 (1924). 14 footnotes.

KNERR, H. C. Duraluminium, a digest of information. *Trans. Am. Soc. Steel Treating* 3: 41-42 (1922). 28 references.

See also ALUMINIUM, ALLOYS.

DUST: Analysis.

BILL, J. PENTEADO. The electrostatic method of dust collection as applied to the sanitary analysis of air. *J. Ind. Hyg.* 1: 323-342 (1919). 40 references.

SMYTH, HENRY F. Critical review of methods for the study of dust content of air. *J. Ind. Hyg.* 1: 140-149 (1919). 25 references.

TROSTEL, L. J., and FREVERT, H. W. Collection and examination of explosive dusts in air. *Ind. Eng. Chem.* 15: 236 (1923). 12 references.

DUST EXPLOSIONS

DEDRICK, W., *et al.* Grain dust explosions. *U. S. Dept. Agr., Bull.* No. 681, 1918. 54 p. Bibl., p. 53-54. 39 references.

PRICE, D. J., *et al.* Dust explosions: theory and nature of phenomena; causes and methods of prevention. Boston, National Fire Protection Assoc., 1922. 246 p. Bibl., p. 241-246. 150 references.

See also COAL DUST.

DUST PREVENTIVES

AMERICAN HIGHWAY ASSOC. Good roads year book, 5th ed., 229-231, 346-358 (1916).

CARNEGIE LIBRARY OF PITTSBURGH. Road dust preventives. Pittsburgh, The Library, 1916. 39 p.

DUST REMOVAL

GIBBS, W. E. Industrial treatment of fumes and dusty gases. *J. Soc. Chem. Ind.* 41: 195T (1922). 36 titles.

See also ELECTRICAL PRECIPITATION.

DYES AND DYEING

BARNETT, EDWARD DE B. Coal tar dyes and intermediates. London, Bailliere, 1919. 213 p. Bibl. at end of each chapter.

BOHN, R. Ueber die Fortschritte auf dem Gebiete der Küpfenfarbstoffe. *Ber.* 43: 987-1007 (1910); *Rev. gén. chim. pure appl.* 13: 257-267 (1910). Bibl. footnotes to about 75 patents.

BOLLEY, POMPEJUS ALEX. Die Theerfarbstoffe. Braunschweig, Vieweg, 1897. 1791 p. Contains bibls.

BRIGGS, T. R. The physical chemistry of dyeing—substantive dyes. *J. Phys. Chem.* 28: 368-386 (1924). Bibl. footnotes.

BRIGL, PERCY. Die chemische Erforschung der Naturfarbstoffe. Braunschweig, Vieweg, 1921. 208 p. Bibl. footnotes.

BUCHERER, HANS T. Lehrbuch der Farbenchemie, einschliesslich der Gewinnung und Verarbeitung des Teers sowie der Methoden zur Darstellung der Vor- und Zwischenprodukte. 2nd ed. Leipzig, Spamer, 1921. 636 p. Bibl., p. 603-636. Classified by dye groups.

CLARKE, A. Coal-tar colours in the decorative industries. London, Constable, 1922. 166 p. Bibl. at end of chapters.

CROOKES, WM. A practical handbook of dyeing and calico-printing. London, Longmans, 1874. 730 p. Bibl., p. 702-715.

DEDEKIND, ALEX. Ein Beitrag zur Purpurkunde. Berlin, Mayer, 1898-1911. 4 vol. Literatur aus dem Zeitraum der letzverflossenen 4 Jahrhunderte ueber die verschiedenen Zweige der Purprologie. v. 4: 321-848.

DYES AND DYEING—*Cont'd*

- DEHN, WM. M. Quinhydrone forms of dyes in solution. *J. Am. Chem. Soc.* 39: 1347 (1917). 50 references.
- ERBAN, FRANZ. [Progress in the preparation and use of oxidizing agents.] *Färber-Ztg.* 26: 228-232, 242-247 (1915). Bibl. footnotes.
- EHRMANN, ÉDOUARD C. A. *Traité des matières colorantes organiques et de leurs diverses applications.* Paris, Dunod, 1922. 615 p. Bibl., p. 599-605.
- ERBAN, FRANZ. [The advance of the preparation and use of vat dyes during the last year.] *Färber-Ztg.* 28: 330-334 (1919).
- FREUNDLICH, H., and LOSEV, G. Ueber die Adsorption der Farbstoffe durch Kohle und Fasern. Ein Beitrag zur Theorie des Farbens. *Z. physik. Chem.* 59: 284-312 (1907). 50 footnotes.
- FRIEDLÄNDER, P. *Fortschritte der Teerfarbenfabrikation und verwandter Industriezweige.* Berlin, Springer, 1877-1921. 13 vols. Abstracts of German patents on dyes and dye intermediates.
- FRIEDLÄNDER, P. *Fortschritte auf dem Gebiete der Teerfarbenfabrikation und den dazu gehörigen Rohprodukten.* *Chem.-Ztg.* 25: 698-703 (1901); 88 footnotes. 26: 697-700 (1902). 34 footnotes.
- GARCON, JULES. *Répertoire général ou dictionnaire méthodique de bibliographie des industries tinctoriales et des industries annexes depuis les origines jusqu'à la fin de l'année 1896.* Paris, Gauthier, 1897. 3 vols. "Originated in chem. sect. of Soc. Ind. de Mulhouse in 1892 and finished in 1897. Refers to 2000 distinct works and 110 periodicals."
- GEBHARD, KURT. Wirkung des Lichtes auf Farbstoffsysteme. *Z. angew. Chem.* 23: 820-827 (1910). 47 footnotes.
- GEBHARD, KURT. Ueber die Veränderung von Färbungen im Licht. *Chem.-Ztg.* 37: 601, 622, 638, 662, 679, 717, 765 (1913). 133 footnotes.
- GEBHARD, K. Zur Theorie der Wollfärbung. I. *Z. angew. Chem.* 27: 297-307 (1914). 40 footnotes.
- GEORGIEVICS, GEORG VON, and GRANDMOUGIN, EUG. A text-book of dye chemistry (The chemistry of dyestuffs). From the 4th German ed. London, Scott, 1920. 560 p. Bibl., p. 545-548.
- GEORGIEVICS, G. v. Jahresbericht ueber die Fortschritte der Teerfarbenfabrikation. *Chem.-Ztg.* 28: 317-321 (1904); 69 footnotes. 29: 902-905 (1905); 86 footnotes. 30: 549-554 (1906); 152 footnotes.
- GRANDMOUGIN, E. *Fortschritte der Farbenchemie von 1908-1910.* *Chem.-Ztg.* 35: 1126, 1158, 1175, 1210, 1230, 1246, 1264, 1274 (1911). 523 footnotes.
- HERZIG, J. *Fortschritte in der Chemie der natürlichen Farbstoffe.* *Chem.-Ztg.* 26: 351-353 (1902); 16 footnotes. 27: 199-203 (1903); 47 footnotes. 28: 287-292 (1904); 36 footnotes. 29: 345-349 (1905); 49 footnotes.
- HEUMANN, K. *Die Anilinfarbstoffe und ihre Fabrikation.* Braunschweig, 1888-1906. 4 vols. Patent literature.
- HEYL, G. Acridine dyestuffs. *Color Trade J.* 5: 79-85 (1919). References through text. 30 patents on p. 81-82.
- HEYL, G. Bibliography on colloid properties of dyes. *Color Trade J.* 15: 6 (1924). 80 references.
- HÜTTIG, GUSTAV F. Physikalisch-chemische Untersuchungen der Oxy- und Dioxanthrachinone mit besonderer Berücksichtigung ihres Beizfärbevermögens. *Z. physik. Chem.* 87: 129-168 (1914). Bibl. footnotes.
- KING, O. E. General review and bibliography of dyeing. First report on colloid chemistry, p. 20-38 (1919); *Color Trade J.* 5: 164-169 (1919); 6: 18-23 (1920); *J. Soc. Dyers Colourists* 35: 171-176, 190-195 (1919). 117 footnotes.
- MATTHEWS, JOSEPH M. Application of dyestuffs to textiles, paper, leather and other materials. New York, Wiley, 1920. 768 p. Bibl., p. 733-750. 500 references.
- MAYER, F. *Die Fortschritte der Farbstoffchemie.* *Chem.-Ztg.* 46: 977, 983, 997, 1026 (1922); 90 footnotes. 47: 213, 257, 273, 281 (1923); 127 footnotes. 48: 213, 242, 250, 289 (1924); 125 footnotes.
- MAYER, FRITZ. *Chemie der organischen Farbstoffe.* 2nd ed. Berlin, Springer, 1924. 265 p. Bibl., p. 248-250.
- MEYER, H. B. B. List of references on dyestuffs, chemistry, manufacture and trade. Washington, Library of Congress, 1919. 186 p. 1650 references, with subject index.
- MICHAELIS, L. Die Theorie des Färbeprozesses. In *Oppenheimer, Handb. Biochem.* 2: 193-212 (1908). 27 footnotes.
- MURRAY, WALLACE J. Bibliography of literature on the fastness of dyes. *Am. Dyestuff Reporter* 10: 123 (1922).

- RHEINBOLDT, H., and WEDEKIND, E. Ueber die Bildung organischer Farbstoffe durch anorganische Substrate. *Kolloidchem. Beihefte* 17: 115-188 (1923). Bibl. footnotes.
- ROUX, A., and MARTINET, JH. [Action of diazoic compounds upon molecules with active methylenic groups.] *Rev. gén. mat. color.* 23: 115, 134 (1923); 24: 13, 74 (1924). 386 references.
- ROWE, F. M. *Colour index*. London, Soc. Dyers Colourists, 1924. 371 p. References to about 1250 dyes.
- ROWE, F. M. [Recent progress in coloring matters.] *J. Soc. Dyers Colourists* 40: 360-373 (1924). Bibl. through text.
- RUPE, H. Fortschritte in der Chemie der natürlichen Farbstoffe. *Chem.-Ztg.* 24: 656-662 (1901). 65 footnotes. (Continued by Herzig.)
- SADTLER, S. P., and MATOS, L. J. Coal tar dyes. *In their Industrial org. chem.*, p. 549-551 (1923). Books only.
- SCHULTZ, GUSTAV. *Farbstofftabellen*. 6th ed. Berlin, Wiedmannsche Buchh., 1923. 2 vols. Bibl., p. 270-284.
- SCHWALBE, CARL G. *Farbstoffe*. *Chem. Z.* 2: 208, 239, 405, 431, 466, 675, 702, 731 (1903); 257 footnotes. 3: 72, 237, 265, 428, 450, 634, 751, 785 (1904); 352 footnotes. 4: 82, 106, 202, 222, 418, 443 (1905); 200 footnotes.
- SCHWALBE, CARL G. Fortschritte der Teerfarbenfabrikation und Farbenchemie. *Chem.-Ztg.* 32: 17-19, 121-124 (1908); 174 references. 33: 9, 31, 38, 59, 66 (1909); 248 footnotes. 33: 958-959, 967-968 (1909); 91 footnotes.
- SCHWALBE, CARL G. Die Färberei im Jahre 1908. *Kolloid-Z.* 5: 129-137 (1909). 57 footnotes.
- SCHWALBE, CARL G. Neuere Färbetheorien. *Sammlung chem. chem.-tech. Vorträge* 12: 113-230 (1907). Bibl. footnotes.
- SOCIETY OF CHEMICAL INDUSTRY. Coloring matters and dyes. *In Reports of the progress of applied chemistry* 1: 67-107 (1916); 110 footnotes. 2: 84-125 (1917); 124 footnotes. 3: 86-114 (1918); 69 footnotes. 4: 83-113 (1919); 127 footnotes. 5: 91-124 (1920); 161 footnotes. 6: 79-111 (1921); 224 footnotes. 7: 83-106 (1922); 98 footnotes. 8: 91-128 (1923); 228 footnotes. 9: 100-141 (1924); 284 footnotes.
- STAEBLE, RUPERT. Die Küpenfarbstoffe der Anthracenreihe. *Chem.-Ztg.* 34: 731, 757, 766, 774, 782 (1910). 166 footnotes.
- TRUTTWIN, H. *Enzyklopädie der Küpenfarbstoffe, ihre Literatur, Darstellungsweise, Zusammensetzung, Eigenschaften in Substanz und auf der Faser*. Berlin, Springer, 1920. 868 p.
- WAHL, ANDRE. *The manufacture of organic dyestuffs*. London, Bell, 1914. 338 p. Bibl., p. 325-328.
- WERNER, A., and PFEIFFER, P. Konstitution und Synthese natürlicher Farbstoffe. *Chem.-Z.* 3: 323, 355, 388, 420 (1904). 91 footnotes.
- "Your technical library." *Am. Dyestuff Reporter* 13: 381-384, 415-418 (1924).
- DYES: Food.**
HESSE, BERNHARD C. Coal tar colors used in food products. *U. S. Dept. Agr., Bur. Chem., Bull. No. 147*, 1912. References through text. Index of authors.
- DYES: Intermediates.** See INTERMEDIATES.
- DYES: Testing.**
MORR, WM. R. Use of the flame arc in paint and dye testing. *Trans. Am. Electrochem. Soc.* 28: 388-396 (1915); *Chem. Eng.* 21: 118-121 (1915). 69 references, annotated.
- DYNAMITE.** See EXPLOSIVES.
- DYSPROSIUM.** See RARE EARTHS.
- EBULLIOSCOPY**
LANDOLT-BÖRNSTEIN. Seidepunkterhöhungen von wässrigen Lösungen. *In their Tabellen*, 4th ed., 1912, 823-828; 5th ed., 1923, 1461-1467.
- MENZIES, A. W. C., and WRIGHT, S. L., JR. Application of a differential thermometer in ebullioscopy. *J. Am. Chem. Soc.* 43: 2314-2323 (1921). 30 references.
- ECGONINE**
MEYER-JACOBSON. Ekgonin. *In their Lehrb. org. Chem.* 2, pt. 3: 1071-1076 (1918). Bibl. footnotes.
- EDEMA**
FISCHER, MARTIN H. Oedema and nephritis; a critical, experimental and chemical study of the physiology and pathology of water absorption in the living organism. 3rd ed. New York, Wiley, 1921. 922 p. Bibl., p. 893-897.
- LOEB, LEO. *Edema*. Baltimore, Williams, 1923. 178 p. Bibl., p. 155-178.
- MCLEAN, FRANKLIN C. *Edema*. *In Barker, Endocrinology and metabolism*, 4: 153-194; references, 5: 511-694 (1922).
- WELLS, H. G. *Edema*. *In his Chemical pathology*, 4th ed., p. 330-366 (1920). 183 references.

EDUCATION. See CHEMICAL EDUCATION.

EGGS

BUSHNELL, L. D., and MAURER, O. Some factors influencing the bacterial content and keeping quality of eggs. *Kansas Agr. Expt. Sta., Bull.* No. 201, p. 749-777 (1914).

JONES, HILTON I., and DuBOIS, ROBERT. The preservation of eggs, including a bibliography of the subject. *J. Ind. Eng. Chem.* 12: 754-757 (1920). Classified by subject.

KOSSOWICZ, ALEXANDER. Die Zersetzung und Haltbarmachung der Eier. Eine kritische Studie mit zahlreichen eigenen Untersuchungen. Wiesbaden, Bergmann, 1913. 74 p. Bibl. footnotes.

NEEDHAM, JOSEPH. The metabolism of the developing egg. *Physiol. Rev.* 5: 51-57 (1925). 309 references.

PARCHTNER, J. Chemie der Eier. In Oppenheimer, Handb. Biochem. 3, pt. 1: 433-447 (1910). 78 footnotes.

EGG PROTEIN

BATEMAN, W. G. Digestibility and utilization of egg protein. *J. Biol. Chem.* 26: 263-291 (1916). 75 references.

See also ALBUMEN, PROTEINS.

ELASTIC GELS

HATSCHKE, EMIL. The properties of elastic gels. *Trans. Faraday Soc.* 16, app.: 35-39 (1921). 14 references.

See also COLLOIDS.

ELECTRIC FURNACE

BILLAZ, A. L'application des fours électriques à la fusion des métaux et alliages non ferreux. *Vie Tech. Ind.* 4: 21-31, 91-101 (1922).

Electric furnace, its origin, transformation and application. *Electrochem.* 3: 88-100 (1904); *Trans. Faraday Soc.* 1: 77-102 (1905).

FINK, COLIN G. High temperature production. In Liddell, Handb. chemical engineering, 2: 519-527 (1922). Bibl. footnotes.

GILLET, H. W., and MACK, E. L. Present tendencies in electric brass furnace. *Brass World* 20: 166 (1924). 40 references, including about 25 patents.

HEROLD, KARL. Elektrische Laboratoriumsöfen. In Doelter, Handb. Mineralchem. 1: 618-628 (1912). Bibl. footnotes.

JUDSON, LYMAN C., and MARTIN, HARRY P. The electric furnace in the iron foundry. *Trans. Am. Electrochem. Soc.*, 41: 295-304 (1922). 46 references, chronological, 1913-1922.

KERSHAW, JOHN B. Electrothermal methods of iron and steel production. London, Constable, 1913. 239 p. Patents, 1898-1911.

LYON, DORSEY A., KEENEY, R. M., and CULLEN, J. F. The electric furnace in metallurgical works. U. S. Bur. Mines, Bull. No. 77, 1914. Bibl., p. 190-207. Classified by metals.

MINET, ADOLPH. Bibliography of the development of the electric furnace. *Trans. Faraday Soc.* 2: 25-28 (1906). 120 references.

MOISSAN, HENRI. Electric furnace. Easton, Chem. Pub. Co., 1904. 305 p. Bibl. of 100 papers (1892-1899) on p. 303-305.

PRING, J. N. Electric furnace. New York, Longmans, 1921. 485 p. Bibl., p. 457-482.

RIBAUD, G. [High frequency induction electric furnace.] *Technique moderne* 15: 225-231 (1923).

STANSFIELD, ALFRED. The electric furnace. New York, McGraw, 1914. 415 p. Bibl. footnotes.

STANSFIELD, ALFRED. The electric furnace for iron and steel. New York, McGraw, 1923, 453 p. Bibl. footnotes.

WEST, CLARENCE J. Electric furnace as applied to metallurgy; a reading list, 1900-1919. *Trans. Am. Electrochem. Soc.* 38: 365-451 (1920). Issued as separate in Bibl. series, A. D. Little, Inc. No. 4, 1920. 92 p. Classified by metals.

WHITE, A. E. The use of the electric furnace in heat treatment. *Trans. Am. Electrochem. Soc.* 46: 402-416 (1924). 67 annotated references.

See also ELECTRODES, ELECTROMETALLURGY, REFRACTORIES.

ELECTRIC INSULATION

Elektrische Isoliermassen. *Kunststoffe* 10: 161-164, 171-173, 177-180, 187-188 (1920). Patents.

FLIGHT, WM. S. Electric insulators: the functions and characteristics of electrical insulating materials (solid, liquid and gaseous); the testing of the materials and their use in the insulation of electrical machinery and apparatus with many data and illustrations from practice. London, Pitman, 1923. 107 p. Bibl., p. 101-104.

HEMMING, EMILE. Review of patents on moulded electrical insulation. In *his* Plastics and moulded electrical insulation, 1923, p. 288-306.

KAUSCH, OSCAR. Die aus der Patentliteratur bekannten Isoliermassen für elektrische und andere Zwecke. *Kunststoffe* 3: 361, 388, 410, 428, 449, 467 (1913). Patents.

MAIN, W. K. [Manufacture of electrical insulators.] *Rev. gén. chim.* 16: 329-337 (1913).

U. S. Bureau of Standards. Bibliography of books and periodical articles on tests, properties and uses of electrical insulating materials. *Letter Circ. LC-50*, 1922. 17 p., mimeographed. About 225 references, chronologically.

U. S. Bureau of Standards. List of the more important U. S. patents covering the materials and methods of manufacture of insulating materials. *Letter Circular LC-51*, 1922. 29 p., mimeographed. About 450 patents, including materials in Classes 18, 91, 106, 134, 154.

See also PLASTICS.

ELECTRIC WELDING

GAMBLE, W. B. List of works in the New York Public Library relating to electric welding. *N. Y. Public Library, Bull.* 17: 375-393 (1913). Arranged chronologically.

JACOB, Wm. F. Bibliography of electric welding. *Gen. Elec. Rev.* 21: 653-658 (1918). About 200 references, covering 1914-1918.

MARQUAND, HILARY S. *Electric welding; its theory, practice, application and economies.* London, Benn, 1920. 204 p. *Bibl.*, p. 196-198.

RAWDON, H. S., *et al.* *Electric arc welding of steel. I. Properties of the arc fused metal.* U. S. Bur. Standards, *Tech. Paper No.* 179, 1920. *Bibl.*, p. 60-63.

ELECTRICAL CONDUCTIVITY

DUTOIT, P. Conductibilité, dissociation et propriété des électrolytes dans des dissolvants autres que l'eau. *J. chim. phys.* 1: 617-657 (1904). *Bibl.* up to Sept., 1903.

FORNAINI, M. La determinazione della conducibilità elettrica specifica nell'esame delle acque potabili. *Ann. chim. appl.* 4: 178-182 (1915). 58 references.

JONES, HARRY C., and BINGHAM, EUGENE C. Conductivity and viscosity of solutions of certain salts in mixtures of acetone with methyl alcohol, with ethyl alcohol and water. *Am. Chem. J.* 34: 481-554 (1905). About 50 footnotes.

JONES, HARRY C., and WEST, AUGUSTUS P. Study of the temperature coefficients of conductivity in aqueous solutions and on the effect of temperature on dissociation. *Am. Chem. J.* 34: 358-422 (1905). About 40 footnotes.

KENDALL, JAMES. The water correction in conductivity determinations.

J. Am. Chem. Soc. 39: 7-24 (1917). *Bibl. footnotes.*

KOHLRAUSCH, FRIEDRICH W. G. *Das Leitvermögen der Elektrolyte, insbesondere der Lösungen.* 2nd ed. Leipzig, Teubner, 1916. *Bibl.*, p. 226-237.

KRAUS, CHARLES A. Relation between the conductance and the viscosity of electrolytic solutions. *J. Am. Chem. Soc.* 36: 35-65 (1914). 49 references.

KRAUS, CHARLES A. *Properties of electrically conducting systems.* New York, Chem. Cat. Co., 1922. 415 p. *Bibl. footnotes.*

LANDOLT-BÖRNSTEIN. *Elektrisches Leitvermögen wässriger Lösungen. In their Tabellen*, 4th ed., 1912, 1119-1120; 5th ed., 1099-1101 (1923). *Nichtwässriger Lösungen. Ibid* 4th ed., 1131; 5th ed., 1114-1115.

MÜLLER, R. *Elektrochemie der nichtwässrigen Lösungen.* Sammlung chem. chem.-tech. Vorträge 27: 243-358 (1924). *Bibl. through text.*

NORBURY, A. L. Electrical conductivity of dilute metallic solid solutions. *Trans. Faraday Soc.* 16: 595-596 (1921). 47 references.

NOYES, ARTHUR A. *Electrical conductivity of aqueous solutions.* Carnegie Inst., *Pub. No.* 63. Washington, 1907. *Bibl. footnotes.*

PARTINGTON, J. R. Conductance, ionization and ionic equilibria. *In* Taylor, *Treatise on physical chemistry* 1: 485-603 (1924). *Bibl. footnotes.*

SCHMIDT, MAURICE R. Conductivity and viscosity in mixed solvents containing glycerol. Thesis, Johns Hopkins Univ., 1909. 63 p. *Bibl. footnotes.*

SCUDDER, HEYWARD. The electrical conductivity and ionization constants of organic compounds—a bibliography of the periodical literature from 1889 to 1910, inclusive, including all important work before 1889 and corrected to the beginning of 1913. New York, Van Nostrand, 1913. 568 p. 2032 references, alphabetical by author with alphabetical list of compounds studied and author reference. Formula index.

STREINTZ, FRANZ. *Das Leitvermögen von gepressten Pulvern.* Sammlung chem. chem.-tech. Vorträge 4: 146 (1903).

SUTTON, WILLARD J., and SILVERMAN, ALEXANDER. The electrical conductivity of sodium chloride in molten glass. *J. Am. Ceram. Soc.* 7: 102-104 (1924).

ELECTRICAL CONDUCTIVITY—Cont'd

TABLES ANNUELLES. Conductibilité électrique des électrolytes. 1: 460 (1910); 59 references. 2: 517 (1911); 60 references. 3: 375-376 (1912); 61 references. 4: 932-934 (1913-16).

WALDEN, PAUL. Elektrochemie nicht-wässriger Lösungen. Leipzig, Barth, 1924. 515 p. Bibl. footnotes.

WALDEN, PAUL. Das Leitvermögen der Lösungen. I Teil. Allgemeines, Methoden, Elektrolyte und Lösungsmittel, Überführungszahl, Ionenchemie. Leipzig, Akad. Verlags., 1924. 383 p. Bibl. footnotes.

WALDEN, PAUL. Das Leitvermögen der Lösungen. II. Zahlenwerte des Leitvermögens in wässrigen und nichtwässrigen Lösungen. Leipzig, Akad. Verlags., 1924. 397 p. Bibl. footnotes. Author index.

WALDEN, P. Ueber organische Lösungs- und Ionisierungsmittel. Z. physik. Chem. 46: 103-188 (1903). Bibl. footnotes.

See also ELECTROCHEMISTRY, ELECTROLYTES.

ELECTRICAL PRECIPITATION (Cottrell's Process).

BRADLEY, LINN. Practical application of electric precipitation and progress of the Research Corporation. Proc. Am. Inst. Elec. Eng. 34: 564-565 (1915). 30 references.

BRADLEY, LINN, EGBERT, H. D., and STRONG, W. W. Dry hot versus cold wet blast furnace gas cleaning. Bull. Am. Inst. Mining Eng. 56: 209-224 (1917).

BUSH, H. J. Electrical precipitation. J. Soc. Chem. Ind. 41: 27T (1922). 30 references.

COTTRELL, F. G. Recent progress in electrical smoke precipitation. Eng. Mining J. 101: 385-389 (1916).

Cottrell process of electrical precipitation. Mining Sci. Press 122: 495-500 (1921). Complete bibl.

ESCHHOLZ, O. H. Electrostatic precipitation. Trans. Am. Inst. Mining Met. Eng. 60: 255-256 (1919); Bull., No. 140: 1305-1306 (1918). 24 references.

GIBBS, W. E. Disperse systems in gases. In Fourth report on colloid chemistry, 1922, p. 122-185. 225 references on smoke, dust and electrical precipitation.

LANDOLT, P. E. Electrical precipitation in the chemical industry. J. Ind. Eng. Chem. 14: 1018-1020 (1922). 29 references.

SCHMIDT, WALTER A. Dust and fume collection by the Cottrell process

of electrical precipitation. Results obtained at the smelter of International Smelting Company, Inspiration, Arizona; factory of Riverside Portland cement company, Riverside, California. Los Angeles, Foster Co., 1916. 48 p. Bibl., p. 47-48.

WESTERN PRECIPITATION Co. Selected bibliography on . . . electrical precipitation of suspended particles from gases. 1920. 5 p.

ELECTRO-ANALYSIS

FISCHER, ARTHUR. Elektroanalyse mit Anwendung intensiv bewegter Elektrolyte. Chem.-Ztg. 31: 25-27 (1907). 28 references.

FISCHER, A. Recent developments in electrochemical analysis. Ion 1: 355-369 (1908). References through text and 113 notes at end.

FISCHER, A. Elektroanalytische Schnellmethoden. Stuttgart, Enke, 1908. 304 p. Bibl., p. 292-295.

FISCHER, A., and SCHEEN, O. Kritische Betrachtung ueber neuere Bestrebungen in der Elektroanalyse. Chem.-Ztg. 34: 477-478 (1910). 37 footnotes.

FRESENIUS, R. Die Entwicklung der Elektroanalyse. Z. anorg. Chem. 81: 4-23 (1912). Bibl. footnotes.

NEUMANN, B. Ueber Elektroanalyse. Chem.-Ztg. 24: 455-458 (1900). 60 footnotes.

STAEHLER, ARTHUR. Ueber einige neuere Fortschritte in der quantitativen Elektroanalyse. Chem.-Ztg. 30: 1203-1204, 1221-1225 (1906). 45 footnotes.

STAEHLER, A. Elektroanalyse. Fortschritte Chem. 1: 124-133 (1909); 2: 124-133 (1910); 4: 67-76 (1911); 7: 293-315 (1913). References through text.

ELECTROCHEMISTRY

ABEL, EMIL. Fortschritte der theoretischen Elektrochemie. Z. angew. Chem. 15: 321-327 (1902); 77 footnotes. 16: 297-304 (1903); 115 footnotes. 17: 833-845 (1904); 222 footnotes. 18: 1505-1512, 1553-1560 (1905); 225 footnotes. 19: 1352-1362 (1906); 205 footnotes. 20: 1271-1277, 1298-1303 (1907); 261 footnotes.

ALLMAND, A. J., and ELLINGHAM, H. J. T. Principles of applied electrochemistry. 2nd ed. N. Y., Longmans, 1924. 727 p. Bibl. footnotes. Author index.

ARNDT, K. Anorganische Elektrochemie. Fortschritte Chem. 1: 34-48, 70-77, 323-331 (1909); 2: 181-189 (1910); 3: 131-149 (1910-11); 4: 7-14 (1911); 5: 15-29 (1912); 6:

- 157-165 (1912-13); 7: 53-62 (1913); 9: 49-60, 177-188 (1914); 10: 303-312 (1914-15); 11: 1-10 (1915-16). References through text.
- BANCROFT, WILDER D. Colloid chemistry and electrochemistry. *Trans. Am. Electrochem. Soc.* 37: 55-70 (1920). 63 footnotes.
- BILLITER, JEAN. Die elektrolytische Alkalichloridzerlegung mit starren Metallkathoden. Halle, Knapp, 1912. 284 p. Gives lists of U. S., English and German patents.
- BLASCHKE, M. Der Fortschritt der Elektrochemie im Jahr 1913. *Elektrochem. Z.* 20: 302, 339 (1914); 21: 10, 39, 67, 99, 129, 179 (1915). About 550 references.
- BLASCHKE, M. Neuere elektrolytische Verfahren auf dem Gebiete der Kohlenstoffverbindungen. *Elektrochem. Z.* 21: 206-211, 261-267 (1914-15). 49 references.
- BRANDT, M. Die Fortschritte der Elektrochemie im Jahre 1914. *Elektrochem. Z.* 21: 247, 296 (1914-15); 22: 13, 42, 74, 109 (1915-16). 135 references.
- Chloralkali-Elektrolyse. In Ullmann. *Enzyk. tech. chem.* 3: 406-440 (1916). References and patents through text.
- CLARKE, ALBERT. The manufacture of chemicals by electrolysis. III. Organic compounds. *Beama* 13: 252 (1923). 53 references.
- ELBS, K. Fortschritte auf dem Gebiete der technischen Elektrochemie. *Chem.-Ztg.* 26: 1034-1038 (1902); 40 footnotes. 27: 1072-1075 (1903); 27 footnotes. 28: 1037-1043 (1904); 44 footnotes.
- FEREHLAND, P. Die englischen elektrochemischen Patente. Halle, Knapp, 1907. 2 vols. Abstracts of patents. Author and subject index.
- FEREHLAND, P. Die elektrochemischen Patentschriften der Vereinigten Staaten von Amerika. Halle, Knapp, 1910. 2 vols. Abstracts of patents. Author and subject index.
- FICHTER, FR. Electrochemical oxidation of aromatic hydrocarbons. *Trans. Am. Electrochem. Soc.* 44: 75-95 (1924). 56 footnotes.
- FICHTER, FR. Function of peroxides and peracids in the electrochemical oxidation of organic compounds. *Trans. Am. Electrochem. Soc.* 45: 231-254 (1924). 77 footnotes.
- FOERSTER, FRITZ. Elektrochemie wässriger Lösungen. 2nd ed. Leipzig, Barth, 1915. 804 p. Bibl. footnotes.
- Fortschritte der Elektrochemie im letzten Jahre. *Elektrochem. Z.* 17: 39-44, 68-70, 101-104 (1910). 66 footnotes.
- GRUBE, GEORG. Elektrochemie der Lösungen. Dresden, Steinkopff, 1922. 268 p.
- GRUBE, GEORG. Grundzüge der angewandten Elektrochemie. Dresden, Steinkopff, 1922. 286 p. Bibl., p. 252-260. 471 titles.
- HERMANN, W. O. Die Fortschritte der Elektrochemie. *Chem.-Ztg.* 37: 749, 779, 792, 811, 885, 918, 935 (1913); 292 footnotes. 40: 873, 886, 913, 938, 957, 979 (1916); 440 footnotes.
- HORSCH, W. G. Progress in inorganic electrochemistry. *J. Ind. Eng. Chem.* 14: 908-910 (1922). 64 references.
- KRÜGER, M. Die Elektrochemie in den Jahren 1900-1905. *Elektrochem.-Z.* 7: 226, 238, 258 (1900); 8: 11, 36 (1901); 227 footnotes. 8: 231, 248, 275 (1902); 170 footnotes. 9: 218, 242, 265 (1903); 10: 8-17 (1903); 280 footnotes. 10: 226, 253, 269 (1904); 11: 10, 36 (1904); 344 footnotes. 11: 213, 234, 254 (1905); 12: 12, 33, 57, 78, 96 (1905); 362 footnotes. 12: 228, 256 (1905); 13: 15, 37, 56, 79, 144, 170 (1906); 269 footnotes.
- LANGMUIR, IRVING. The relation between contact potentials and electrochemical action. *Trans. Am. Electrochem. Soc.* 29: 125-182 (1916). References through text.
- LÖB, W. Organische Elektrochemie. *Fortschritte Chem.* 1: 118-124 (1909); 2: 21-28 (1910); 3: 207-212 (1910-11); 7: 207-219 (1913). References through text.
- MEINGAST, RUDOLF. Die Fortschritte der elektrochemischen Industrie in den Jahren 1916-1919. *Chem.-Ztg.* 44: 873, 917, 942, 955, 981, 992 (1920). 357 footnotes.
- MÖLLER, JOH. Ueber elektrochemische Reaktionen in der organischen Chemie. *Elektrochem. Z.* 11: 227-231, 249-253 (1904); 12: 6-11, 24-27, 51-56 (1905). 84 footnotes.
- MOTTELAY, P. F. Bibliography of electrochemistry and allied subjects. *Trans. Am. Electrochem. Soc.* 13: 453-479 (1908).
- SOCIETY OF CHEMICAL INDUSTRY. Electrochemistry. In *Reports of the progress of applied chemistry*, 2: 276-304 (1917); 244 references. 3: 238-260 (1918); 138 references. 4: 249-280 (1919); 216 references. 5: 271-290 (1920); 20 references. 6: 295-316 (1921); 81 references. 7: 245-276 (1922); 94 references. 8: 269-300 (1923); 59 references. 9: 250-277 (1924); 83 footnotes.

ELECTROCHEMISTRY—Cont'd

SPRINGFELDT, B. Elektrochemie im Jahre 1907. *Elektrochem. Z.* 14: 206-210, 254-256; 15: 8-13 (1907-1908). 95 references.

STRACHAN, E. K. Progress in organic electrochemistry. *J. Ind. Eng. Chem.* 14: 910-912 (1922). 27 references.

Serial

Jahrbuch der Elektrotechnik. Übersicht über die wichtigeren Erscheinungen auf dem Gesamt-Gebiete der Elektrotechnik. München, Oldenbourg. 1912-. . . Contains a section on electrochemistry.

Zeitschrift für Elektrochemie. Leipzig, Verlag Chemie. 1894-. . . Early vols. contained abstracts and patents. Since 1907, only patents have been abstracted.

ELECTRODE POTENTIALS

GERKE, ROSCOE H. A summary of electrode potentials. *Chem. Rev.* 1: 377-395 (1925). Bibl. through text.

SULLIVAN, M. X., COHEN, B., and CLARK, WM. M. Studies on oxidation-reduction. IV. Electrode potentials of indigo sulfonates, each in equilibrium with its reduction product. *Public Health Repts.* 38: 1669-1718 (1923); Reprint No. 848. 52 p. Bibl., p. 50-52. 62 references.

WILSMORE, N. T. M. Ueber Elektroden Potentials. *Z. physik. Chem.* 35: 291-332 (1900). 50 footnotes.

ELECTRODES: Calomel.

PALMAER, WILH. Ueber das absolute Potential der Kalomelelektrode. *Arkiv. Kemi, Mineral. Geol.* 2: No. 38: 73-78 (1907); *Z. physik. Chem.* 59: 187-191 (1907). About 125 references, 1875-1906.

ELECTRODES: Carbon.

BOHM, RICHARD. Bogenlicht Elektroden. *Chem.-Ztg.* 40: 637-639, 655-657, 667-669, 690-693 (1916). Bibl. footnotes.

Manufacture of carbon electrodes for electrometallurgical purposes. *Chem. Met. Eng.* 19: 184 (1918). 50 references.

NATIONAL CARBON Co. The carbon electrode. New York, National Carbon Co., 1920. 18 p. Bibl., p. 12-18. Chronological.

Production of carbon electrodes for metallurgical purposes.] *Stahl u. Eisen* 32: 1857-1865 (1912).

See also ELECTRIC FURNACE.

ELECTRODES: Hydrogen.

LOOMIS, H. E., and ACREE, S. F. Application of the hydrogen electrode to the measurement of the hydrolysis of aniline acetate and the ionization

of acetic acid in the presence of neutral salts. *Am. Chem. J.* 46: 621-637 (1911). 73 references.

ELECTROLYSIS

ENGELHARDT, VIKTOR. Die Elektrolyse des Wassers. Halle, Knapp, 1902. 117 p. Bibl., p. 3-6. Bibl. footnotes.

WEBB, W. WALTER. Index to the literature of electrolysis and its applications, 1784-1880. *Annals N. Y. Acad. Sci.* 2, 314-349 (1882-1883).

See also CONCRETE, ELECTROLYSIS IN; CORROSION; ELECTROCHEMISTRY.

ELECTROLYTES

ACREE, S. F. Reactions of both the ions and the non-ionized form of electrolytes. *Am. Chem. J.* 49: 345-368 (1913). Bibl. footnotes.

DRUCKER, K. Die Anomalie der starken Elektrolyte. *Sammlung chem. chem.-tech. Vorträge* 10: 1-66 (1905). Bibl. footnotes.

EBERT, LUDWIG. Neuere Forschungen über die Anomalie der starken Elektrolyte. *Jahrb. Radioakt. Elektronik* 18: 134-137 (1921-22). 105 references.

KENDALL, JAMES. The abnormality of strong electrolytes and the ionization theory of Ghosh. *J. Am. Chem. Soc.* 44: 717-738 (1922). About 70 footnotes.

LUNDEN, HARALD. Ueber amphotere Elektrolyte. *Arkiv Kemi, Mineral. Geol.* 2, No. 11: 1-44 (1905). Bibl. footnotes.

SNETHLAGE, H. C. S. Eine Hypothese ueber den Zustand gelöster Elektrolyte. *Z. physik. Chem.* 90: 1-46, 139-188 (1915). Bibl. footnotes.

WALDEN, P. Ueber abnorme Elektrolyte. *Z. physik. Chem.* 43: 385-464 (1903). About 200 footnotes.

WINKELBLECH, K. Ueber amphotere Elektrolyte und innere Salze. *Z. physik. Chem.* 36: 546-595 (1901). 65 footnotes.

See also ELECTROCHEMISTRY, ELECTRICAL CONDUCTIVITY, ELECTRONICS.

ELECTROLYTIC DISSOCIATION

CREIGHTON, HENRY J. M. Electrolytic dissociation in non-aqueous solutions. *J. Franklin Inst.* 182: 745-760 (1916); 186: 675-698 (1918). 80 footnotes.

DRUCKER, C. Weitere Untersuchungen ueber die Dissoziation ternärer Elektrolyte. *Z. physik. Chem.* 96: 381-427 (1920). Bibl. footnotes.

JELLINEK, KARL. Ueber die Leitfähigkeit und Dissoziation von Natriumhydrosulfite und hydroschwefliger Säure in Vergleich zu analogen Schwefelsauerstoffverbindungen. *Z.*

- physik. Chem. 76: 257-354 (1911).
Bibl. footnotes.
- JONES, HARRY C. The dissociating power of different solvents. *Am. Chem. J.* 25: 232-249 (1901). About 100 footnotes.
- LANDOLT-BÖRNSTEIN. Konstanten der elektrolytischen Dissoziation. In *their* Tabellen, 4th ed., 1912, 1176-1177, 1186-1187; 160 references. 5th ed., 1923, 1120-1123, 1155-1157, 1163-1164.
- LUNDEN, HARALD. Affinitätsmessungen an schwachen Säuren und Basen. Sammlung. chem. chem.-tech. Vorträge 14: 103-110 (1908). 191 references.
- RABINOWITSCH, A. J. Ueber die anomale Dissoziation an wässrigen Lösungen. I. *Z. physik. Chem.* 99: 338-360 (1921). II. Die elektrolytische Dissoziation der Salze in konzentrierten Lösungen, in Schmelzflüssen und im fester Zustände. *Ibid.* 417-433. III. Die Umkehrung der Molarleitfähigkeitskurven und die anomale Dissoziation. *Ibid.* 434-453. Bibl. footnotes.
- SACHANOV, A. Ueber die Einwirkung der Elektrolyte auf das Dissoziationsvermögen von Lösungsmitteln. *Z. physik. Chem.* 87: 441-448 (1914). 30 footnotes.
- SACHANOV, A. N. Investigations upon abnormal electrolytic dissociation. *J. Phys. Chem.* 21: 189 (1917). 20 references.
- WALDEN, P. Ueber den Zusammenhang des nicht dissoziierten Anteils (1- α) der gelösten Salze mit der Dielektrizitätskonstante ϵ der Lösungsmittel. *Z. physik. Chem.* 94: 374-404 (1920). Bibl. footnotes.
- See also ELECTRICAL CONDUCTIVITY, ELECTROCHEMISTRY, ELECTROLYTES, ELECTRONICS.
- ELECTROMETALLURGY**
- GORE, GEORGE. The art of electrometallurgy including all known processes of electrodeposition. New York, Appleton, 1877. 391 p. Patents, p. 370-381.
- PETERS, FRANZ. Die Elektrometallurgie der Alkalimetalle, 1909-1915. Glückauf 52: 437, 457, 477 (1916). Bibl. footnotes.
- PETERS, FRANZ. Die Elektrometallurgie der Erdalkalimetalle, 1909-1915. Glückauf 52: 237-243, 263-267 (1915). Bibl. footnotes.
- PETERS, FRANZ. Die Elektrometallurgie der eisenähnlichen Metalle im Jahrzehnt 1906-1915. Glückauf 53: 149, 176, 212, 234, 277 (1917). Bibl. footnotes.
- PETERS, FRANZ. Die Elektrometallurgie der Eisenlegierungsmetalle seit 1915. Glückauf 56: 761, 793, 810, 835, 863, 906 (1920). Bibl. footnotes.
- PETERS, FRANZ. Fortschritte in der Elektrometallurgie der Leichtmetalle. Glückauf 45: 1583-1591 (1909).
- PETERS, FRANZ. Elektrometallurgie, 1905-1906. Glückauf 41: 717, 751, 812 (1905); 42: 1384, 1419, 1443, 1469, 1519, 1552, 1582, 1619, 1644 (1906). Bibl. footnotes.
- RIDEAL, ERIC K. Industrial electro-metallurgy, including electrolysis and electrothermal processes. London, Bailliere, 1918. 247 p. Contains bibl.
- ROEBER, E. F. Electrometallurgy. Intern. Engr. Congr., 1915, Metallurgy, 457-478. 50 references, critically selected.
- SCHMIDT, F. Die neuere Entwicklung der Elektrometallurgie einiger wichtiger Metalle. *Chem.-Ztg.* 37: 55, 81, 209, 257, 330 (1913). 93 footnotes.
- See also ELECTRIC FURNACE, ELECTROCHEMISTRY, METALLURGY and the various metals, Metallurgy.
- ELECTROMOTIVE FORCE**
- ABEGG, RICHARD W. H., AUERBACH, FR., and LUTHER R. Messungen elektromotorischer Kräfte galvanischer Ketten mit wässrigen Elektrolyten. Halle, Knapp, 1911. 213 p. Bibl., p. 1-108.
- SCHOCK, E. P. Electromotive force of nickel. *Am. Chem. J.*, 41: 208-232, 233-256 (1909). 26 references.
- THOMPSON, M. DE K. Electromotive force of couples. *J. Am. Chem. Soc.* 28: 735-736 (1906). 27 references.
- TABLES ANNUELLES. Forces électromotives. (F. E. M.) 1: 491-506 (1910); 2: 544-571 (1911); 3: 394-416 (1912); 4: 980-1015 (1913-16).
- TOLMAN, RICHARD C. Electromotive force produced in solutions by centrifugal action. *J. Am. Chem. Soc.* 33: 121 (1911). *Proc. Am. Acad. Arts Sci.* 46: 110 (1910). 15 references.
- ELECTRONICS**
- CRAVER, H. W. List of books on the electron. *J. Am. Inst. Elec. Eng.* 41: suppl. 10-12 (1922). 21 titles.
- HERZFELD, KARL F. Bericht über die Grösse der Moleküle, Atome und Ionen und die Methoden zu ihrer Bestimmung. *Jahrb. Radioakt. Elektronik* 19: 260-265 (1922). 153 references.
- LADENBURG, RUDOLF. Die Elektronenordnung in den Elementen der grossen Perioden. *Naturwissenschaften* 8: 11 (1920). 18 references.

ELECTRONICS—Cont'd

LITERATUR DER ELEKTRONIK. (Includes electrolytic dissociation, luminescence, valence, catalysis, chemical action of ions, electrolytes, chemical action of light, radioactivity.) *Jahrb. Radioakt. Elektronik* 1: 83, 198, 316, 433 (1904-5); 2: 109, 220, 346, 476, (1905-6); 3: 94, 227, 338, 483 (1906-7); 4: 114, 218, 346, 463 (1907-8); 5: 100, 219, 378, 553 (1908-9); 6: 128, 246, 409, 640 (1909); 7: 188, 313, 464, 640 (1910); 8: 187, 309, 440, 549 (1911); 9: 140, 301, 476, 649 (1912); 10: 124, 278, 409, 534 (1913); 11: 143, 278, 394, 524 (1914); 12: 115, 231, 328, 443 (1915); 13: 126, 263, 342, 453 (1916); 14: 130, 248, 374, 491 (1917); 15: 103, 195, 293, 369 (1917-18); 16: 97, 232, 312, 423 (1919-20).

ELECTROOSMOSIS

BARY, PAUL. L'electroosmose. *Chimie & Industrie* 7: 650 (1922). 58 references.

BRIGGS, T. R. Electrical endosmose. I. II. Second report on colloid chemistry, p. 38-39, 47-52 (1919). Covers 1912-1918.

"Endosmosis and exosmosis." *Ind.-Cat. S. G. O.*, 1st ser., 4: 241-242 (1883).

FREUNDLICH, H. The effective potential difference of electroosmosis and allied phenomena. *Trans. Faraday Soc.* 16: App. 146-149 (1921). 17 references.

ELECTROPLATING

BLUM, W. Recent progress in electroplating and electroforming. *Trans. Am. Electrochem. Soc.* 45: 129-134 (1924); *Brass World* 20: 155-156 (1924). 32 footnotes.

HORSCH, W. G., and FUWA, TYLER. Study of the throwing power and current efficiency of zinc plating solutions. *Trans. Am. Electrochem. Soc.* 41: 383 (1922). 35 references.

HUGHES, W. E. Modern electroplating. London, Frowde, 1923. 160 p.

HUGHES, W. E. The electrodeposition of metals. *Beama* 9: 137-144, 335-344, 555-562 (1921); 10: 138-143 (1922). Nickel, 38 footnotes; zinc, 51 footnotes; lead, 37 footnotes; tin, 37 footnotes.

NEUKAM, K. Fortschritte auf dem Gebiete der Galvanotechnik in den Jahren 1912-1914. *Z. angew. Chem.* 26: 441-444 (1913); 77 footnotes. 27: 649-653 (1914); 80 footnotes. 28: 452-455, 463-467 (1915); 102 footnotes.

SAND, HENRY J. S. The rôle of colloids in electrolytic metal deposition. Fourth report on colloid chemistry, 1922, p. 346-356. 64 references.

STOCKMEIR, HANS. Fortschritte der chemischen Metallbearbeitung und verwandter Zweige. *Chem.-Ztg.* 24: 796-798 (1900); 26: 523-526 (1902); 27: 697-698 (1903); 28: 182-184 (1904); 29: 261-263 (1905); 30: 343-346 (1906); 35: 749-751, 765-767 (1911); 36: 1165-1166, 1206-1207 (1912); 37: 1417-1419, 1454-1455 (1913). Bibl. footnotes.

ELECTRO-REDUCTION

RUSS, RUDOLF. Ueber Reaktionbeschleunigungen und -hemmung bei elektrischen Reduktionen und Oxydationen. *Z. physik. Chem.* 44: 641-720 (1903). 70 footnotes.

RUSS, R. Die elektrische Reduktion. *Jahrb. Radioakt. Elektronik* 1: 170-197 (1904). Bibl. footnotes.

SNOWDEN, RALPH C. Electrolytic reduction of nitrobenzene. *J. Phys. Chem.* 15: 797-844 (1911). 125 footnotes.

See also ELECTROCHEMISTRY.

ELEMENTS

BASKERVILLE, CHARLES. The elements, verified and unverified. *Proc. Am. Assoc. Adv. Sci.* 53: 24-56 (1904). Elements arranged chronologically.

FRIEND, J. N. Elements. *In his Text-book*, 1: pt. 1: 26-97, 265-289 (1914). Bibl. footnotes.

LANDOLT-BÖRNSTEIN. Schmelzpunkte, Siedepunkte und enantiotrope Umwandlungspunkte des Elemente. *In their Tabellen* 4th ed., 1912. 162 ff.; 5th ed., 1923, 320 ff.

MELLOR, J. W. The classification of the elements. *In his Inorg. theor. chem.* 1: 248-269 (1922). 75 references.

WAGNER, ANTON. Die Neuentdeckungen auf dem Gebiete der chemischen Grundstoffe seit 1888. *Chem.-Ztg.* 26: 1103-1107 (1902). 136 footnotes.

See also names of the individual elements, ATOMIC WEIGHT, PERIODIC LAW.

ELLAGIC ACID

NIERENSTEN, M. Ellagsäure. *In Abderhalden, Biochem. Handl.*, 7: 9-13 (1912). 40 footnotes.

EMBALMING

"Embalming." *Ind.-Cat. S. G. O.*, 1st ser., 4: 184-185 (1883); 2nd ser., 4: 857 (1899).

MCCURDY, CHARLES W. Embalming and embalming fluids with the bibliography of embalming. Post-

Graduate and Wooster Quarterly, Apr., 1896, p. 44-84.

EMERY. See ABRASIVES.

EMETICS

"Emetics." Ind.-Cat. S. G. O., 1st ser., 4: 211-213 (1883); 2nd ser., 4: 889-890 (1899).

EMULSIN

CLAUSEN, ROY E. Behavior of emulsin in the presence of collodion. J. Biol. Chem. 17: 413-441 (1914). 50 footnotes.

ZUNZ, EDGARD. Emulsin. In Abderhalden, Biochem. Handl. 5: 564-568 (1911). 90 footnotes.

See also ENZYMES.

EMULSIONS

CLARK, G. L., and MANN, WM. A. Quantitative study of the adsorption in solution and at interfaces of sugars, dextrin, starch, gum arabic and egg albumin and the mechanism of their action as emulsifying agents. J. Biol. Chem. 52: 157-182 (1922). Bibl. footnotes.

CLAYTON, WM. The theory of emulsions and emulsification. London, Churchill, 1923. 160 p. Bibl., p. 145-157. 200 references.

DONNAN, F. G. Emulsions and emulsification. Trans. Faraday Soc. 16, App.: 17-21 (1921). 80 references.

HATSCHEK, EMIL. Emulsions. In Second report on colloid chemistry, 1918, p. 20-21.

THOMAS, ARTHUR W. Emulsions—theory and practice. J. Am. Leather Chem. Assoc. 15: 186-201 (1920). Bibl. through text.

THOMAS, ARTHUR W. A review of the literature of emulsions. J. Ind. Eng. Chem. 12: 177-181 (1920). 44 references through text.

See also COLLOIDS, PHOTOGRAPHY.

ENAMELS

PURDY, ROSS C. Chemical rôle of boron in glazes. Trans. Am. Ceram. Soc. 14: 731-739 (1912). 20 footnotes.

STALEY, HOMER F. Materials and methods used in the manufacture of enameled cast iron ware. U. S. Bur. Standards, Tech. Paper No. 142, 1919. 158 p. About 100 footnotes.

WEST, CLARENCE J. A reading list on vitreous enameling on iron and steel. J. Am. Ceram. Soc. 4: 47-64 (1921). About 350 references, with annotations, covering 1907-1920.

WEST, CLARENCE J. United States patents relating to enamels with special reference to enamels for iron and steel. J. Am. Ceram. Soc. 3: 893-899 (1920). About 100 patents, 1900-1920.

The last two papers were reprinted as Bibliographic Series No. 7, A. D. Little, Inc., Cambridge, Mass., 1921. 27 p.

See also CERAMICS, GLASS.

ENZYMES

ABDERHALDEN, EMIL. Abwehrfermente des tierischen Organismus gegen körper-, blutplasma- und zellfremde Stoffe, ihr Nachweis und ihre diagnostische Bedeutung zur Prüfung der Funktion der einzelnen Organe. Berlin, Springer, 1913, 299 p. Bibl., p. 207-229. English trans., 3rd ed., London, Bale, 1914. 242 p. Bibl., p. 215-242.

ABDERHALDEN, EMIL. Schutzfermente des tierischen Organismus. Ein Beitrag zur Kenntniss der Abwehrmassregeln des tierischen Organismus gegen körper-, blut- und zellfremde Stoffe. Berlin, Springer, 1912. 100 p. Bibl., p. 100-110.

BATELLI, F., and STERN, L. Die Oxydationsfermente. Ergeb. Physiol. 12: 96-120 (1912). 676 references.

BAYLISS, W. M. Colloid chemistry in physiology. In second report on colloid chemistry, 1918, p. 117-172. Bibl. at ends of various sections.

BAYLISS, W. M. The nature of enzyme action. 3rd ed. New York, Longmans, 1914. 180 p. Bibl., p. 157-174.

"Blood, ferments of the." Ind.-Cat. S. G. O., 3rd ser., 3: 74-75 (1922). 55 references.

BONNS, WALTER W. Etherization of tissues and its effect on enzyme activity. Ann. Mo. Botanical Garden 5: 289-299 (1918). About 200 references.

CZAPEK, F. Allgemeine Chemie der Enzyme. Kinetik der Enzymreaktionen. In his Biochemie der Pflanzen, 3rd ed., 1: 95-127 (1922). Bibl. footnotes.

DOX, ARTHUR W. The intracellular enzymes of *Penicillium* and *Aspergillus*, with special reference to those of *Penicillium camemberti*. U. S. Dept. Agr., Bur. Animal Ind., Bull. No. 120, 1910. 70 p. Bibl., p. 66-70.

EFFRONT, JEAN. Biochemical catalysts in life and industry. Proteolytic enzymes. New York, Wiley, 1917. 752 p. Contains bibls.

EFFRONT, J. Enzymes and their application. New York, Wiley, 1902. 334 p. Bibl. at ends of chapters.

EULER, H. Allgemeine Chemie der Enzyme. Ergeb. Physiol. 6: 187-193 (1907); 9: 241-243 (1908). About 450 references.

ENZYMES—Cont'd

- EULER, H. v. Ergebnisse und Ziele der allgemeiner Enzym-Chemie. Ber. 55: 3583-3600 (1922). About 40 footnotes.
- FALK, K. GEORGE. The chemistry of enzyme action. 2nd ed. New York, Chem. Cat. Co., 1924. 250 p. Bibl. footnotes.
- FISCHER, HUGO. Die chemische Bestandteile der Schizomyceten und der Eumyceten. In Lafar, Handb. der technischen Mykologie, 1: 239-241, 295-302 (1904-07).
- FUNK, CASIMIR. Proteolytische Zellfermente. Biochem. Centr. 8: 421-429 (1909). 36 references.
- GREEN, JOSHUA R. The soluble ferments and fermentation. 2nd ed. Cambridge, Univ. Press, 1901. 512 p. Bibl., p. 463-504.
- GRÜTZNER, P. v., and WALDSCHMIDT, W. Ueber Fermentgesetze. Arch. ges. Physiol. 141: 63-117 (1911). Bibl. footnotes.
- HÖBER, RUDOLF. Die Fermente. In his Physikalische Chemie der Zelle und der Gewebe, 4th ed., p. 662-728 (1914). Bibl. footnotes.
- JACOBY, MARTIN. Ueber die Bedeutung der intracellulären Fermente für die Physiologie und Pathologie. Ergeb. Physiol. 1: 213-215 (1902). 120 references.
- KUHN, RICHARD. Ueber die spezifische Natur und der Wirkungsmechanismus kohlenhydrat- und glykosidspaltender Enzyme. Naturwissenschaften 11: 732-742 (1923). 40 references.
- KYLIN, HARALD. Ueber Enzymbildung und Enzymregulation bei einigen Schimmelpilzen. Jahrb. wiss. Bot. Leipzig, 53: 465-501 (1914).
- LAFAR, FRANZ. Handbuch der technischen Mykologie. Jena, Fischer, 1905-1908. 5 vols. Bibl. through text.
- MEYERHOF, OTTO. Ueber Hemmung von Fermentreaktionen durch indifferente Narkotika. Arch. ges. Physiol. 157: 251-306 (1914). Bibl. footnotes.
- OPIE, EUGENE L. Intracellular digestion. The enzymes and antienzymes concerned. Physiol. Rev. 2: 552-585 (1922). 109 references.
- OPPENHEIMER, CARL. Die Fermente und ihre Wirkung. 4th ed. Leipzig, Vogel, 1913. 2 vols. Bibl. footnotes.
- OPPENHEIMER, CARL. Die tierischen Fermente. In his Handb. Biochem., 2nd ed., 1: 754-908 (1924). 818 footnotes.
- POZZI-ESCOT, M-EMM. The reducing enzymes. Am. Chem. J. 29: 517-563 (1903). Bibl. footnotes.
- SAMUELY, FRANZ. Tierische Fermente. In Oppenheimer. Handb. Biochem. 1: 501-582 (1909). 558 references.
- STERN, ERNST. Physikalisch-chemische Grundlage der Fermentwirkung. In Oppenheimer, Handb. Biochem. 4, pt. 2: 529-586 (1910). 125 references. 2nd ed., 2: 111-199 (1923). 196 footnotes.
- TRIER, G. [The chemical nature of enzymes.] Schweiz. Apoth. Ztg. 54: 161-165, 176-179 (1916).
- VANDELVELDE, A. J. J. Sur quelques réactions enzymatiques. Bull. soc. chim. Belg. 21: 21-33 (1907). Bibl. footnotes.
- VERNON, H. M. Intrazelluläre Enzyme. Ergeb. Physiol. 9: 139-147 (1909). About 400 references.
- WAKSMAN, SELMAN A. Enzymes of microorganisms. Abst. Bact. 6: 265-299, 331-360 (1922). 957 references.
- WALLIS, R. L. MACKENZIE. Critical review of the protective enzymes of the body. Quart. J. Med. 9: 138-163 (1916).
- WELLS, H. G. Enzymes. In his Chemical Pathology, 4th ed., p. 48-100 (1920). About 400 footnotes.
- WILLSTÄTTER, RICHARD. Ueber Isolierung von Enzymen. Ber. 55: 3601-3623 (1922). About 50 footnotes.
- ZUNZ, EDGARD. Fermente. In Abderhalden, Biochem. Handl. 5: 538-665 (1911). Bibl. footnotes.
- See also names of various enzymes.
- EPHEDRINE**
FOURNEAU, ERNEST, and KANAO, SEIZO. Sur la synthèse de l'éphédrine. Bull. soc. chim. 35: 623-625 (1924). 41 references.
- SCHMIDT, E. L'éphedrine et la pseudoéphedrine. Mon. Sci. 85: 151-159, 197-206 (1918). Bibl. footnotes.
- EPINEPHRINE.** See ADRENALINE.
- ERBIUM.** See RARE EARTHS.
- EREPSIN**
BLOOD, ALICE F. The erepsin of the cabbage. J. Biol. Chem. 8: 215-225 (1910). 25 footnotes.
- See also ENZYMES.
- ERGOT**
BARGER, GEORGE, and DALE, H. H. Ergotoxine and some other constituents of ergot. Biochem. J. 2: 298-299 (1907).
- "Ergot." Ind.-Cat. S. G. O., 1st ser., 4: 318-325 (1883); 2nd ser., 5: 98-99 (1900).
- HASKELL, CHAS. C., and ECKLER, CHAS. R. Relative strength of fresh

and old samples of the fluid extract of ergot. *J. Am. Pharm. Assoc.* 1: 412-427 (1912). 21 references.

ERGOTIN

"Ergotin and ergotinine." *Ind.-Cat. S. G. O.*, 1st ser., 4: 325-326 (1883); 2nd ser., 5: 99-100 (1900).

See also ERGOT.

ERUCIC ACID

HOLDE, D., and WILKE, C. Ueber Eruksäure und Eruksäureanhydrid. *Z. angew. Chem.* 35: 186-187 (1922). 21 footnotes.

MEYER-JACOBSON. Eruksäure. *In their Lehrb. org. Chem.* 1, pt. 1: 977-978 (1907). 35 references.

See also ACIDS, ORGANIC.

ERYTHRITOL

MEYER-JACOBSON. Erythrit. *In their Lehrb. org. Chem.* 1, pt. 2: 172-177 (1913).

ESSENTIAL OILS

BAUDRY, RENÉ. Méthode de recherche microchimique pour certains constituants des huiles essentielles. *Thesis, Univ. Paris*, 1919. 154 p. *Bibl.*, p. 147-150.

BOURNOT, K. Fortschritte auf dem Gebiete der ätherischen Öle und der Chemie der Terpene in den Jahren 1920-1921. *Chem.-Ztg.* 45: 569-571, 586-587, 590-591 (1921); 65 footnotes. 46: 1041-1042, 1065-1067, 1086-1087, 1089-1091 (1922). 102 footnotes.

FACHINI, S. Rendiconto dei lavori pubblicati durante l'anno 1913 sugli oli eteri e sui profumi. *Ann. chim. appl.* 2: 304-315 (1914); 3: 181-197 (1915). 114 footnotes.

GILDEMEISTER, E., and HOFFMANN, FR. The volatile oils. 2nd ed. *Tr. by E. Kremers*. New York, Longmans, 1913-1922. 3 vols. *Bibl. footnotes*.

HESSE, ALBERT. Die ätherischen Öle. *Chem.-Z.* 2: 434, 464, 497, 534 (1903); 158 footnotes. 2: 697, 728 (1903); 45 footnotes. 3: 456, 475, 505, 533, 562 (1904); 183 footnotes.

LEIMBACH, R. Ätherische Öle. *In Abderhalden, Biochem. Handl.* 7: 551-682 (1912). *Bibl. footnotes*.

LEIMBACH, ROBERT. Die ätherischen Öle. Halle, Knapp, 1910. 331 p.

MEYER-JACOBSON. Bestandteile ätherischer Öle. *In their Lehrb. org. Chem.* 2, pt. 4: 6-84 (1924). *Bibl. footnotes*.

PELLINI, G. Rassegna dei lavori pubblicati durante gli anni 1914-1918 su gli olii eteri ed i profumi. *Giorn. chim. ind.* 1: 119-126, 178-188 (1919). 55 footnotes.

RECLAIRE, A. Fortschritte auf dem Gebiete der ätherischen Öle und

Riechstoffe. *Z. angew. Chem.* 25: 2580-2589 (1912); 80 footnotes. 26: 617-625 (1913); 152 footnotes. 27: 572-584 (1914); 192 footnotes. 28: 369-374 (1915); 86 footnotes. 29: 353-359 (1916); 113 footnotes. 30: 217-218, 222-224, 225-228 (1917); 105 footnotes.

RECLAIRE, A. Fortschritte auf dem Gebiete der Terpene und ätherischen Öle. *Chem.-Ztg.* 36: 1125-1126, 1150-1152, 1161-1162 (1912); 109 footnotes. 38: 729-731, 770-771, 783-784, 874-877 (1914); 162 footnotes. 40: 977-978, 987-989, 1000-1001, 1019-1022 (1916); 173 footnotes. 44: 853-854, 865-867, 869-871, 875-876, 882-884, 894-896, 935-936 (1920); 193 footnotes.

RICHTMANN, W. O. Bibliography of aromatic waters. *Pharm. Arch.* 4: 1-20, 36-40, 57-60, 64-77, 181-191, 106-220, 221-240 (1901). Also issued as a sep., 1902. 173 p. Author and subject index.

ROCHUSSEN, F. Fortschritte auf dem Gebiete des Camphers, der ätherischen Öle und Riechstoffe. *Z. angew. Chem.* 17: 140-146, 164-169 (1904); 93 footnotes. 18: 1129-1134, 1174-1178 (1905); 95 footnotes. 19: 1926-1931, 1955-1961 (1906); 114 footnotes. 20: 1400-1410 (1907); 90 footnotes. 21: 1501-1506, 1547-1556 (1908); 125 footnotes. 22: 1670-1681 (1909); 75 footnotes. 23: 1496-1504 (1910); 60 footnotes. 24: 2185-2195 (1911); 64 footnotes.

ROCHUSSEN, F. Fortschritte auf dem Gebiete der Terpene und ätherischen Öle. *Chem.-Ztg.* 27: 233-238 (1903); 148 footnotes. 28: 225-229 (1904); 107 footnotes. 29: 379-384 (1905); 112 footnotes. 30: 185-189 (1906); 111 footnotes. 31: 223-225, 239-241 (1907); 87 footnotes. 32: 473-475, 486-487, 493-495, 517-519 (1908); 127 footnotes. 33: 677-679, 686-688, 694-696, 702-705 (1909); 181 footnotes. 34: 385-387, 407-411 (1910); 133 footnotes and 40 patents. 35: 545-546, 565-567, 574-576 (1911); 81 footnotes and 25 patents.

SADTLER, S. P., and MATOS, L. J. Essential oils and resins. *In their Industrial org. chem.* 1923: 139-140. Books only.

SOCIETY OF CHEMICAL INDUSTRY. Fine chemicals, medicinal substances and essential oils. *In Reports of the progress of applied chemistry*, 1: 271-297 (1916); 186 footnotes. 2: 468-494 (1917); 154 footnotes. 3: 430-456 (1918); 180 footnotes. 4: 489-507 (1919); 129 footnotes. 5:

ESSENTIAL OILS—Cont'd

- 486-504 (1920); 107 footnotes. 6:
517-538 (1921); 167 footnotes. 7:
488-509 (1922); 105 footnotes. 8:
518-540 (1923); 138 footnotes. 9:
551-575 (1924); 133 footnotes.

TABLES ANNUELES. Huiles essentielles.
1: 627-631 (1910); 2: 680-685
(1911); 3: 478-482 (1912); 4: 1158-
1173 (1913-1916). Bibl. footnotes.

THOMS, H. Ueber die wichtigsten
Fortschritte auf dem Gebiete der
ätherischen Öle. Chem.-Ztg. 24: 497-
499 (1900); 50 footnotes. 25: 996-
998 (1901); 46 footnotes.

UMNEY, J. C. A dictionary of essen-
tial oils. Perfumery. Essent. Oil
Record 7: 152-206 (1916). Bibl. refer-
ences. Arranged by botanical
names with index of common names.

VERSCHAFFELT, Ed. Bloemengem. Een
Litteratuuroverzicht. Chem. Week-
blad 5: 456-458 (1908). 77 refer-
ences.

"Volatile oils." Ind.-Cat. S. G. O., 1st
ser., 10: 122 (1889); 2nd ser., 12:
140 (1907).

ETHANE

BAUM, FRITZ. Ethan. In Abderhalden,
Biochem. Handl. 1: 55-58 (1911). 70
references.

See also HYDROCARBONS.

ETHYL ACETATE

WORDEN, E. C. Ethyl acetate. In his
Technology of cellulose esters 1:
2500-2504 (1921). Bibl. footnotes.

ETHYL ACETOACETATE

MEYER-JACOBSON. Acetessigsäure-
aethylester. In their Lehrb. org.
chem. 1, pt. 2: 1125-1140 (1913).
Bibl. footnotes.

SEYMOUR, PAUL H. Bibliography of
acetacetic ester and its derivatives.
1840-1891. Smithsonian Misc. Coll.,
No. 970, 1894. 136 p. Chronological,
annotated, with author and subject
index.

TAFEL, JULIUS. Eine Anomalie bei der
Acetessigester Reduktion. Ber. 45:
437-452 (1912). Bibl. footnotes.

ETHYL ALCOHOL

DEMUTH, RUDOLF v. Ueber die Gewinn-
ung von Spiritus von Holz. Z.
angew. Chem. 26: 786-792 (1913).
69 references.

ELLRODT, —. Äthylalkohol. In Ullmann,
Enzyk. tech. Chem. 1: 793-795
(1914). Books and list of period-
icals. See also references through
text, p. 636-793.

GENKGROSS, OTTO. Aethylalkohol. In
Abderhalden, Biochem. Handl. 1:
386-410 (1911). 500 references.

HERRICK, RUFUS F. Denatured or in-
dustrial alcohol. New York, Wiley,

1907. Patents, p. 494-497. Bibl.,
p. 493.

KRESSMANN, F. W. The manufacture
of ethyl alcohol from wood waste.
U. S. Dept. Agr., Bull. No. 983,
1922. 101 p. Patents, p. 98-100.
Bibl., p. 101.

McKELVY, E. C. Bibliography of the
literature of alcohol and alcoholome-
try. Bull. U. S. Bur. Standards 9:
436-474 (1913); Sci. Paper 197.
1377 references, 1769-1913, arranged
chronologically with decimal classi-
fication of subjects.

MEYER-JACOBSON. Äthylalkohol. In
their Lehrb. org. Chem. 1, pt. 1:
227-234 (1907). Bibl. footnotes.

MONIER-WILLIAMS, G. W. Power al-
cohol, its production and utilization.
London, Frowde, 1922. 323 p. Bibl.
at end of chapters.

SCHWEIZER, KARL. Das Brennereige-
werbe im Jahre 1914-1920. Schweiz.
Chem.-Ztg. 1920: 25-33, 513-520. 119
references. 1921: 395, 407, 419. 77
references.

SCHWEIZER, K. Äthylalkoholindustrie
im Jahre 1921. Schweiz. Chem. Ztg.
1922: 551, 567, 599. 244 footnotes.

SIMMONDS, CHARLES. Alcohol, its pro-
duction, properties, chemistry and
industrial applications; with chap-
ters on methyl alcohol, fusel oil and
spirituous beverages. London, Mac-
millan, 1919. 574 p. Bibl., p. 551-555.

WEST, CLARENCE J. Production of al-
cohol from sulfite waste liquors.
Paper 25, No. 13: 19 (1919). Bibl.
Series, A. D. Little, Inc., Cambridge,
Mass., No. 2.

WORDEN, E. C. Ethyl alcohol. In his
Technology of cellulose esters 1:
2412-2428 (1921). Bibl. footnotes.

See also ALCOHOLS, FERMENTATION,
SULFITE WASTE LIQUOR (Johnsen).

ETHYL ALCOHOL: Physiological effects.

ABDERHALDEN, EMIL. Bibliographie
der gesamten wissenschaftlichen Lit-
eratur ueber den Alkohol und den
Alkoholismus. Berlin, Urban, 1904.
504 p.

"Alcohol." Ind.-Cat. S. G. O., 1st ser.,
1: 173-179 (1880); 2nd ser., 1: 217-
222 (1896); 3rd ser., 1: 243-259
(1918).

ATHANASIU, I. [Alcohol as a food.]
Rev. gen. sci. 31: 714-718 (1920).

BILLINGS, J. S. Bibliography (anno-
tated) on the physiological and path-
ological effects of alcohol and al-
coholic drinks. Washington, 1894.

FOERSTER, R. Beziehungen zwischen
Alkohol und Muskelarbeit. Arch.
ges. Physiol. 144: 51-70 (1912).
Bibl. footnotes.

- HANEBOG, —. [The effect of alcohol upon digestion in the stomach.] *Acta Medica Scand.* 1921, suppl. 1. 182 references.
- KOCHMANN, MARTIN, and HALL, WALTER. Die Einfluss des Alkohols am Hungertier auf Lebensdauer und Stoffumsatz. *Arch. ges. Physiol.* 127: 280-356 (1909). Bibl. footnotes.
- MILES, WALTER R. Comparative concentration of alcohol in human blood and urine at intervals after ingestion. *J. Pharmacol.* 20: 265-319 (1922). 82 references.
- ROSEMANN, R. Umsatz der Nährstoffe. Alkohol. In Oppenheimer, Handb. Biochem. 4, pt. 1: 413-444 (1911). 78 footnotes. 2nd ed. 8: 482- (1924). Bibl. footnotes.
- SCHMIDT, P. Bibliographie des Alkoholismus der letzten zwanzig Jahre (1880-1900). Dresden, 1901.
- SCHWEISSEIMER, —. Der Alkoholgehalt des Blutes unter verschiedenen Bedingungen. Dissertation, München, 1913. *Deutsch Arch. klin. Med.* 109: 271 (1913). 219 titles.
- STARLING, ERNEST H. The action of alcohol on man. New York, Longmans, 1923. 291 p. Bibl., p. 279-286.
- ETHYL BROMIDE**
- BAUM, FRITZ. Äthylbromid. In Abderhalden, Biochem. Handl. 1: 63-70 (1911). Bibl. footnotes.
- "Ethyl bromide." Ind.-Cat. S. G. O., 1st ser., 4: 379 (1883); 2nd ser., 5: 161-162 (1900).
- ETHYL CHLORIDE**
- BASKERVILLE, CHARLES. The chemistry of anesthetics. V. Ethyl chloride. *J. Ind. Eng. Chem.* 5: 828-831 (1913). Bibl. footnotes.
- BAUM, FRITZ. Äthylchlorid. In Abderhalden, Biochem. Handl. 1: 58-63 (1911). Bibl. footnotes.
- ETHYL DIAZOACETATE**
- MEYER-JACOBSON. Diazo-essigsäure-äthylester. In *their* Lehrb. org. Chem. 1, pt. 2: 803-807 (1913). Bibl. footnotes.
- ETHYL ETHER**
- BASKERVILLE, CHARLES, and HAMOR, W. A. The chemistry of anesthetics. I. Ethyl ether. *J. Ind. Eng. Chem.* 3: 301-317, 378-398 (1911). Bibl. footnotes.
- "Ether." Ind.-Cat. S. G. O., 1st ser., 4: 362-367 (1883); 2nd ser., 5: 141-146 (1900).
- GERNGROSS, OTTO. Diäthyläther. In Abderhalden, Biochem. Handl. 1: 411-420 (1911). About 175 footnotes.
- MERCIER, CHARLES A. L'éther considéré comme agent d'anesthésie générale. Paris, Steinheil, 1895. 203 p. Bibl., p. 199-203.
- MEYER-JACOBSON. Diäthyläther. In *their* Lehrb. org. Chem. 1, pt. 1: 292-298 (1913). Bibl. footnotes.
- ETHYL IODIDE**
- BAUM, FRITZ. Äthyljodid. In Abderhalden, Biochem. Handl. 1: 70-71 (1911). 75 footnotes.
- ETHYL MALONATE**
- MEYER-JACOBSON. Malonsäurediäthylester. In *their* Lehrb. org. Chem. 1, pt. 2: 334-342 (1913). Bibl. footnotes.
- ETHYL NITRITE**
- RICHTMANN, W. O., and ANDERSON, J. A. Spirit of nitrous ether and ethyl nitrite. 1900. 168 p. "Bibliographical index of chemical research and standard pharmaceutical and chemical literature."
- ETHYL OXALACETATE**
- MEYER-JACOBSON. Oxal-essigester. In *their* Lehrb. org. Chem. 1, pt. 2: 1198-1204 (1913). Bibl. footnotes.
- ETHYLENE**
- BAUM, FRITZ. Äthylene. In Abderhalden, Biochem. Handl. 1: 121-125 (1911). 100 footnotes.
- CURME, GEORGE O., JR. Sources and uses of ethylene and propylene. *Chem. Met. Eng.* 20: 907 (1921).
- HARVEY, EDWARD M. Some effects of ethylene on the metabolism of plants. *Bot. Gaz.* 60: 213-214 (1915). Thesis, Univ. Chicago, 1914. 36 references.
- MALISOFF, WM., and EGLOFF, GUSTAV. Ethylene. *J. Phys. Chem.* 23: 132-138 (1919). 324 references.
- See also HYDROCARBONS.
- ETHYLENE CHLOROHYDRIN**
- BROOKS, BENJAMIN T. Ethylene and propylene chlorohydrins and glycols from oil gas. *Chem. Met. Eng.* 22: 629-633 (1920). 41 references.
- CURME, GEORGE O., JR. Ethylene chlorohydrin and ethylene oxide. *Chem. Met. Eng.* 25: 1091 (1921).
- ETHYLENE DICHLORIDE**
- CURME, GEORGE O., JR. Ethylene dichloride. *Chem. Met. Eng.* 25: 999 (1921).
- ETHYLENE GLYCOL**
- MEYER-JACOBSON. Äthylenglykol. In *their* Lehrb. org. Chem. 1, pt. 2: 79-82 (1913).
- ETHYLENE OXIDE**
- BODFORSS, SVEN. Die Aethylenoxyde, ihre Darstellung und Eigenschaften. Sammlung chem. chem.-tech. Vorträge 26: 145-227 (1922). Bibl. footnotes.
- EUCAINE**
- "Eucaine." Ind.-Cat. S. G. O., 2nd ser., 5: 165-166 (1900).

EUCALYPTOL

BARTELT, K. Cineol (Eucalyptol). *In* Abderhalden, Biochem. Handl. 7: 533-537 (1912). 75 footnotes.

"Eucalyptus and eucalyptol." *Ind.-Cat. S. G. O.*, 1st ser., 4: 381-382 (1883); 2nd ser., 5: 166-167 (1900).

EUCUPIN. *See* QUININE (Laqueur).

EUGENOL

EINBECK, H. Eugenol. *In* Abderhalden, Biochem. Handl. 1: 647-656 (1911). 165 references.

MEYER-JACOBSON. Eugenol. *In their* Lehrb. org. Chem. 2, pt. 1: 433-434 (1896). Bibl. footnotes.

EUROPIUM. *See* RARE EARTHS.

EUTECTICS

BRADY, F. L. The structure of eutectics. *J. Inst. Metals* 28: 412-413 (1922). 19 references.

EVAPORATION

BADGER, W. L. Vapor recompression systems for evaporators. *Trans. Am. Inst. Chem. Eng.* 14: 251-255 (1923); *Chem. Met. Eng.* 28: 77-78 (1923). 94 references.

LIVINGSTON, GRACE J. Evaporation. *Mo. Weather Rev.* 36: 181-186, 301-306, 375-381 (1908); 37: 68-72, 103-109, 157-160, 193-199, 248-252 (1909). Reprinted, 1909. 121 p. Annotated.

EXPLOSIVES

BARNETT, EDWARD DE B. Explosives. London, Bailliere, 1919. 241 p. Bibl., p. 15-16.

BIEDERMANN, RUDOLF. Die Sprengstoffe, ihre Chemie und Technologie. Leipzig, Teubner, 1910. 130 p. Bibl., p. 129-130.

BRUNSWIG, H. Die Explosivstoffe; Einführung in die Chemie der explosiven Vorgänge. Leipzig, Göschen, 1907. 158 p. Bibl., p. 151-152.

COLVER, E. DE W. S. High explosives. London, Lockwood, 1918. 830 p. Bibl., p. 750-752; patents, p. 753-765.

DAVIS, T. L. Bibliography (on explosives, 1918-1920). *Mem. poudres* 19: 200-215 (1922).

DUIN, C. F., VAN, and LENNEP, B. C. R. VAN. Recherches sur les explosifs nitrés. Brisants modernes. *Rec. trav. chim.* 39: 145-177 (1924). Bibl. footnotes.

FARMER, ROBERT C. The manufacture and use of explosives, with notes on their characteristics and testing, for chemists, ordnance officers, mining engineers and students. London, Pitman, 1921. 116 p. Bibl., p. 113-114.

GIUA, MICHELE. Chimica della sostanza esplosiva. Milan, 1919. 556 p. Bibl. footnotes.

GUTTMANN, OSKAR. The manufacture of explosives; a theoretical and

practical treatise on the history, the physical and chemical properties and the manufacture of explosives. London, Whittaker, 1895. 2 v. Bibl., v. 2: 411-427. 400 references with author index. *Also in German.* Die Industrie der Explosivstoffe. Braunschweig, Vieweg, 1895. 704 p. Bibl., p. 673-687.

MARSHALL, JOHN A. Manufacture and testing of military explosives. New York, McGraw, 1919. 261 p. Bibl., p. 213-253. 500 references.

MARSHALL, JOHN A., and STORM, C. G. Military explosives. Rev. ed. U. S. War Dept., Doc. No. 947. 1924. 158 p. Bibl., p. 150-158.

MEHREN, —. Neuere und neueste Arbeiten auf dem Gebiete der Schiesspulver und Sprengstoffe. *Z. ges. Schiess.-Sprengstoffw.* 16: 65-67, 74-75 (1921). References through text.

MUNROE, CHARLES E. Index to the literature of explosives. Baltimore, Friedenwald, 1886-1893. 2 pts.

MUNROE, CHARLES E. Notes on the literature of explosives. Nos. 1-28. U. S. Naval Inst., Proc. 8-23 (1882-1897).

ODDO, BERNARDO. Gli alti esplosivi. *Ann. chim. appl.* 11: 165-198 (1919). Bibl. footnotes.

OELKER, A. Tabellarische Uebersicht über die während des Krieges auf dem Gebiete des Schiess- und Sprengstoffwesens erschienenen In- und Auslandpatente. *Z. ges. Schiess.-Sprengstoffw.* 15: 1-3, 20-23, 36-38, 51-53, 66-68, 76-79 (1920). 188 patents.

OELKER, ADOLF. Sprengverfahren nach der Patentliteratur tabellarisch zusammengestellt. *Z. ges. Schiess.-Sprengstoffw.* 9: 344-347, 357-360, 369-371 (1913). 10: 140-141, 169-170, 217-218, 342-345 (1914). Patents.

OELKER, A. [Fuses and igniters.] *Z. ges. Schiess.-Sprengstoffw.* 10: 4-6, 27-28, 41-42 (1915). 80 patents, 1877-1912.

Rise and progress of the British explosives industry. London, Whittaker, 1909. 418 p. Bibl., p. 170-179. 125 titles, 1560-1909.

SOCIETY OF CHEMICAL INDUSTRY. Explosives. *In* Reports of the progress of applied chemistry, 4: 523-573 (1919); 250 footnotes. 5: 523-565 (1920); 211 footnotes. 6: 565-591 (1921); 82 footnotes. 8: 540-566 (1923). 137 references. 9: 617-636 (1924); 102 footnotes.

TAYLOR, GUY B., and COPE, W. C. Initial priming substances for high explosives. U. S. Bur. Mines, Tech.

- Paper No. 162, 1917. 32 p. Bibl. of 115 references, p. 25-32.
- TAYLOR, C. A., and RINKENBACH, WM. H. Explosives, their materials, constitution and analysis. U. S. Bur. Mines, Bull. No. 219, 1923. 188 p. Bibl. footnotes.
- VRIES, EDWARD DE. Fortschritte der Schiess- und Sprengstoff-Industrie. Chem.-Ztg. 30: 893-895 (1906); 20 footnotes. 32: 765-767, 781-782 (1908); 21 footnotes. Cf. KELBETZ, *Ibid.* 28: 343-345 (1904).
- WEBER, HENRY C. P. On a modified form of stability test for smokeless powder and similar materials. Bull. U. S. Bur. Standards 9: 128-129 (1912).
- WORDEN, E. C. Cellulose nitrate smokeless powder. In *his* Technology of cellulose esters 1: 2921-2987 (1921). Bibl. footnotes.
- ZAHN, CHR. Explosivstoffe und Zündstoffe. Z. angew. Chem. 26: 145-154 (1913); 153 footnotes. 27: 257-271 (1914); 258 footnotes.
- See also NITROCELLULOSE.
- EYE BALL**
- STEINDORFF, KURT. Chemie des Augenapfels. In Oppenheimer, Handb. Biochem. 2, pt. 2: 338-368 (1909). 160 footnotes.
- FASTING**
- HOWE, P. E., and HAWK, P. B. Fasting studies. J. Am. Chem. Soc. 33: 215-254 (1911). 70 references.
- See also NUTRITION.
- FATIGUE**
- HASTINGS, A. B. The physiology of fatigue—Physico-chemical manifestations of fatigue in the blood. U. S. Public Health Bull., No. 117, 1921. 42 p. Thesis, Columbia Univ., 1921. Bibl., p. 41.
- LEE, FREDERICK S. Effect of temperature and humidity on fatigue. Am. J. Pub. Health 2: 863-870 (1912). Bibl. footnotes.
- SPAETH, REYNOLD A. Tests for fatigue—chemical reactions. J. Ind. Hyg. 1: 50 (1919). 29 references.
- FATS (Including Oils and Waxes).**
- ADDENS, H. SMIT. [Review of methods for the neutralization of free fatty acids in fats.] *Olien en Vetten* 3: 277-279 (1919). Dutch and Italian literature.
- BORNEMANN, G. Fortschritte auf dem Gebiete der Fett-Industrie, Seifen- und Kerzen-fabrikation. Chem.-Ztg. 24: 735-738 (1900); 70 footnotes. 25: 641-645 (1901); 81 footnotes. 26: 432-435 (1902); 52 footnotes. 27: 403-406 (1903); 67 footnotes. 28: 474-477 (1904); 29: 873-876 (1905); 30: 399-401 (1906); 47 footnotes. 31: 637-638; 667-668 (1907); 54 footnotes. 32: 741-743, 755-756 (1908); 111 footnotes. 33: 793-795, 802-805 (1909); 121 footnotes.
- BORNEMANN, G. Fette und fette Oele. Chem. Rev. Fett Harz Ind. 9: 43-44, 68-71, 94-98 (1902); 10: 100-102, 128-130, 149-151 (1903); 11: 93-94; 114-116 (1904). Bibl. footnotes.
- BORNEMANN, G. Fette und fette Oele. Chem.-Z. 1: 406-408, 696-698 (1902); 65 footnotes. 2: 151-154, 461-463, 670-672, 700-701 (1903); 87 footnotes. 3: 70-72, 271-274, 537-539 (1904); 95 footnotes. 4: 9-13, 249-251, 534-537 (1905); 150 footnotes.
- BRAHM, CARL, and GRÜN, AD. Fette und Wachse. In Abderhalden, Biochem. Handl. 3: 1-224 (1911); 8: 367-460 (1914). Many hundred footnotes.
- BRANNT, WM. T. Practical treatise on animal and vegetable fats and oils. Philadelphia, 1896. 2 vols. Contains U. S. patents, 1870-1896.
- CONGRES DE LA PRODUCTION COLONIALE, Marseille, 1922. Memoires et rapports sur les matières grasses. 2 vols. "Bibliographie sommaire de l'arachide," vol. 1: 315-325; "Bibliographie," vol. 1: 403-468.
- CZAPEK, F. Der Reservefett der Samen. In *his* Biochemie der Pflanzen, 3rd ed., 1: 709-733 (1922). Bibl. footnotes.
- FABRIS, G. Rivista dei lavori sugli olii grassi. Ann. chim. appl. 1: 63-83, 260-264 (1914); 164 footnotes. 3: 349-371 (1915); 228 footnotes.
- FAHRION, W. Die Fettanalyse und die Fettchemie, 1901-1915. Z. angew. Chem. 15: 125-134 (1902); 99 footnotes. 16: 73-85 (1903); 134 footnotes. 17: 810-815, 866-874, 917-926 (1904); 242 footnotes. 18: 369-374, 402-416 (1905); 223 footnotes. 19: 985-993, 1044-1053 (1906); 241 footnotes. 20: 817-829 (1907); 205 footnotes. 21: 1125-1134, 1219-1228 (1908); 278 footnotes. 22: 769-778 (1909); 205 footnotes. 23: 446-450, 490-498 (1910); 244 footnotes. 24: 241-254 (1911); 262 footnotes. 25: 870-882 (1912); 223 footnotes. 26: 181-197 (1913); 352 footnotes. 27: 273-290 (1914); 351 footnotes. 28: 161-170, 183-192 (1915); 394 footnotes. 29: 137-142, 153-161, 169-172 (1916); 294 footnotes. 30: 125, 138, 142, 147, 150, 157 (1917); 254 footnotes.
- FAHRION, W. Fortschritte der theoretischen Fettchemie. Chem. Umschau

FATS (Including Oils and Waxes)—*Cont'd*

- 23: 127-130 (1916); 24: 141-145 (1917); 25: 121-123 (1918); 26: 209-211 (1918); 26: 209-211 (1919); 27: 225-228 (1920); 28: 281-284 (1921). Bibl. footnotes.
- FAHRION, W. Fortschritte der technischen Fettchemie. Chem. Umschau 23: 155-161 (1916); 24: 153-156 (1917); 25: 133-135 (1918); 26: 221-223 (1919); 27: 238-242 (1920); 28: 295-300 (1921). Bibl. footnotes.
- GLIKIN, W. Fette und Lipide. In Oppenheimer, Handb. Biochem. 1: 90-158 (1909). Fats and fatty acids, 144 footnotes; cholesterol, 45 references; lipids, 90 references.
- GRÜN, AD. Die Fettchemie und Fettindustrie in den Jahren 1914-1922. Chem.-Ztg. 43: 717, 737, 758, 778, 801, 821 (1919); 418 footnotes. 47: 817, 825, 838, 845, 857, 865, 877, 885, 897 (1923); 619 footnotes.
- HEFTER, GUSTAV. Fortschritte der Öl- und Fettindustrie im Jahre 1909. Chem.-Ztg. 34: 837, 846, 855, 866, 874 (1910); 331 footnotes.
- HEPBURN, JOSEPH S. Critical study of the natural changes occurring in fats and oils. J. Franklin Inst. 168: 365-384, 421-456; 169: 23-54 (1909-1910). 134 references.
- HERBIG, W. Jahresbericht auf dem Gebiete der Fette und Öle. Chem. Rev. Fett Harz Ind. 12: 44, 75, 96, 122, 152 (1905); 13: 44, 76, 99, 126, 154, (1906); 14: 28, 47, 72, 100, 128, 156 (1907); 15: 44, 100, 128, 156, 184 (1908); 16: 48, 79, 100, 129, 162, 182, 218 (1909); 17: 28, 40, 67, 94, 121, 148 (1910); 18: 70, 98, 126, 154, 179, 207, 234, 262 (1911); 19: 105, 131, 156, 181, 206, 235, 261, 288 (1912); 20: 45, 73, 96, 127, 152, 179, 204, 237 (1913); 21: 44, 75, 99, 132, 153, 183, 207, 213, 219, 229 (1914); 22: 17, 28, 38, 47, 57, 67, 80, 90, 99, 108 (1915). Bibl. footnotes.
- HERBIG, W. Jahresbericht auf dem Gebiete der Fette, Öle und Wacharten. Seifenfabr. 36: 237, 258, 274, 290, 310, 325, 341, 358, 374, 393 (1916); 264 references. 37: 477, 505, 577, 602 (1917); 38: 27, 51, 118, 141, 169, 191 (1918); 218 footnotes. 39: 505, 540, 572, 603, 635, 665, 698 (1919); 40: 17, 65, 97, 131, 148, 163, 181, 199, 216 (1920). Bibl. footnotes.
- HERBIG, W. Jahresbericht auf dem Gebiete der Fette, Öle und Wacharten. Z. deut. Oel Fett Ind. 41: 353, 386, 403, 417, 435, 450, 481, 500, 515, 538, 555, 574, 603, 650, 666, 683, 697, 713, 730, 752, 768, 790, 811, 830, 853 (1921); 42: 7, 39, 76, 98, 137, 153, 185, 201, 233, 249, 267, 283, 480, 494, 509, 526, 565, 581, 597, 631, 664, 677, 698, 713, 728, 746, 759, 776, 791, 897, 922 (1922); 43: 3, 17, 36, 53, 67, 83, 100, 114, 131 (1923). Bibl. footnotes. 43: 641, 653, 667, 680, 693, 707, 720, 729, 741 (1923); 44: 13, 27, 38, 51, 75, 87, 121, 135, 157, 170, 182, 193, 208, 229, 253, 266, 285, 301, 315, 328, 340 (1924). 707 footnotes.
- LEATHES, JOHN B. The fats. New York, Longmans, 1910. 138 p. Bibl., p. 125-133.
- LEWKOWITSCH, J. Chemical technology and analysis of oils, fats and waxes. 6th ed. London, Macmillan, 1923. 3 vols. Numerous bibl. footnotes.
- MITCHELL, C. A. Edible oils and fats. London, Longmans, 1918. 159 p. Bibl., p. 124-151. 450 references.
- MOCK, H., and BLUM, A. List of U. S., British and German patents covering the manufacture of butter substitutes, hydrogenated oils and various oils and milk products. New York, 1918. 120 p.
- MONTEL, D. [Bibliography on the production of fatty substances.] Bull. mat. grasses inst. colonial Marseille, 1922: 237-300. Classified by oils.
- POWICK, WILMER C. Compounds developed in rancid fats with observations on the mechanism of their formation. J. Agr. Res. 26: 360-362 (1924).
- SADTLER, S. P., and MATOS, L. J. Fats and fatty oils. In *their* Industrial org. chem., 1923, p. 108-109. Books only.
- SCHACHT, PETER. Beiträge zur Synthese der Fette. Symmetrische Glyceride. Dissertation, Zürich, 1908. 60 p. Bibl., p. 23-26.
- SOCIETY OF CHEMICAL INDUSTRY. Oils, fats and waxes. In Reports of the progress of applied chemistry, 1: 165-179 (1916); 2: 305-321 (1917); 3: 261-285 (1918); 4: 281-299 (1919); 5: 291-308 (1920); 6: 317-329 (1921); 7: 271-281 (1922); 8: 301-318 (1923); 9: 304-327 (1924). Bibl. footnotes.
- TABLES ANNUELLES. Corps gras et cires. 1: 632-636 (1910); 2: 686-690 (1911); 3: 483-487 (1912); 4: 1174-1179 (1913-1916).
- TEIXEIRA DA FONSECA, E. Oleos vegetaes Brasileiros. Rio de Janeiro, 1922. 130 p.
- ULZER, FERDINAND. Neuerungen und Fortschritte auf dem Gebiete der Fette und Naphthaprodukte. Chem.-Ztg. 24: 755-759 (1900); 92 footnotes. 25: 728-730 (1901); 70 foot-

notes. 27: 723-727 (1903); 165 footnotes.

ULZER, F., and PASTROVITCH, P. Jahresbericht ueber die Fortschritte auf dem Gebiete der Fette und Wachse. Chem.-Ztg. 29: 652-657 (1905); 172 footnotes. 31: 747-748, 770-771, 779-781 (1907); 178 footnotes. 32: 1237-1238, 1252-1253 (1908); 83 footnotes. 33: 1337-1339, 1345-1346 (1909); 110 footnotes.

WHITE, HORACE L. The modification of the composition of vegetable oils, with special reference to increasing unsaturation. J. Ind. Eng. Chem. 11: 651 (1919).

Serial

Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze (Continuation of Chemische Revue ueber die Fett- und Harz-industrie). 1894-. Abstracts classified as follows: Theory; analytical; technology; preparation; resins; mineral oils, hydrogenation; saponification; soaps; lakes and varnishes; patents; books.

FATS: Analytical.

BERBERICH, F. M., and BURR, A. Ueber die verschiedenen Methoden der Fettbestimmung im Rahm. Chem.-Ztg. 31: 813-816, 823-825 (1907); 45 footnotes.

FAHRION, W. Fortschritte der analytischen Fettchemie. Chem. Umschau 23: 141-145 (1916); 24: 141-145 (1917); 25: 121-123 (1918); 26: 209-211 (1919); 27: 225-228 (1920); 28: 281-284 (1921). Bibl. footnotes.

MCLHINEY, PARKER C. Investigations on certain methods of analysis of fats and resins. Easton, Chem. Pub. Co., n. d. References through text.

PRESCHER, JOHANNES. Ueber die Destillation der fluechtigen Fettsauren und den Wert der Reichert-Meissl-Zahl. Chem.-Ztg. 38: 1081-1083, 1091-1093 (1914). 111 footnotes.

THURSTON, AZOR. Pharmaceutical and food analysis; a manual of standard methods for the analysis of oils, fats and waxes and substances in which they exist, together with allied products. New York, Van Nostrand, 1922. 416 p. Contains bibl.

FATS: Extraction.

EDDY, C. F. Solvent extraction of vegetable oils. J. Ind. Eng. Chem. 14: 810-811 (1922). 26 references.

KAUSCH, O. Oil and fat extractors. Z. deut. Oel Fett Ind. 42: 4-6, 23-24, 37-39, 61-63, 100, 123-125 (1922). 49 German patents listed.

FATS: Physiological.

BLOOR, W. R. Normal fat metabolism. In Barker, Endocrinology and metabolism, 3: 183-211; references, 5: 345-509 (1922).

BLOOR, W. R. Fat transport in the animal body. Physiol. Rev. 2: 92-115 (1922). 75 references.

CONNSTEIN, WILHELM. Ueber fermentative Fettsplattung. Ergeb. Physiol. 3: 194-199 (1904). 151 references.

CRONER, WILHELM. Die neueren Ergebnisse der Frage von der Fettresorption. Biochem. Centr. 3: 94-98 (1904). 32 references.

DIETRICH, A., and KLEEGER, J. Die Störungen des Zellularen Fettstoffwechsels. Ergeb. allgem. Path. 20, pt. 2: 913-931 (1924). 599 references.

FÜRTH, OTTO v. Digestion and resorption of fats. Fat metabolism. Obesity. In his Chemistry of metabolism, 1916, 350-400. 120 footnotes.

MAGNUS-LEVY, A., and MEYER, L. F. Die Fette im Stoffwechsel. In Oppenheimer, Handb. Biochem. 4, pt. 1: 445-488 (1911). 245 footnotes. 2nd ed., 8: 422-481 (1924). 460 footnotes.

PORGES, OTTO. Ueber den Abbau der Fettsauren im Organismus. Ergeb. Physiol. 10: 1-5 (1909). 104 references.

ROSENFELD, G. Fettbildung. Ergeb. Physiol. 1: 651-654 (1902); 2: 50-56 (1903). 284 references.

WORINGER, PETER. La dégradation des acides gras dans l'organisme animal. Bull. soc. chim. biol. 3, No. 7: 119-138 (1922). Also as separate, Paris, Masson, 1922. 140 p.

FECES

LOHRISCH, HANS. Methoden zur Untersuchungen der menschlichen Faeces. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 6, No. 1: 33-356 (1923). Bibl. footnotes.

SCHREUER, MAX. Kotbildung, Zusammensetzung und Chemie der Faeces. In Oppenheimer, Handb. Biochem. 3, pt. 2: 171-205 (1909). 121 footnotes. 2nd ed., 5: 345-384 (1924). 179 footnotes.

SCHUMM, O. Die chemische Untersuchungen der Faeces. In Neuberg, Der Harn, p. 1131-1276.

FELDSPAR

BAUR, EMIL. Bildung der Feldspate aus waessrigen Loesungen bei hohem Druck. In Doelter, Handb. Mineralchem. 2, pt. 2: 556-567 (1917). Bibl. footnotes.

FELDSPAR—*Cont'd*

- DOELTER, C. Kalifeldspat. In *his* Handb. Mineralchem. 2, pt. 2: 482-488 (1917). Bibl. footnotes.
- GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Feldspar. (1913-1919.) 1920. 16 p. Bibl., p. 15-16.
- JESSER, L. Chemische-technische Verwertung des Kalifeldspats. In Doelter, Handb. Mineralchem. 2, pt. 2: 567-579 (1917). Bibl. footnotes.
- KIRKPATRICK, F. A. Fusion study of the mineral systems feldspar calcite and feldspar magnesite. Trans. Am. Ceram. Soc. 18: 575-618 (1916). About 80 references.
- SCHMID, H. S. DE. Feldspar in Canada. Canada, Dept. Mines, Mines Br., Pub. No. 401, 1916. 125 p. Bibl., p. 107-108; includes patents on the manufacture of feldspar products. 33 references.
- FELT.** See TEXTILES.
- FENCHENE**
- QVIST, WALTER. Einige Untersuchungen ueber die Konstitution der Fenchon Kohlenwasserstoffe. Ann. 417: 278-324 (1918). Bibl. footnotes.
- See also ESSENTIAL OILS, HYDROCARBONS.
- FERMENTATION**
- AMSTEL, JEANNE E. VON. De temperatuursinvloed op physiologische processen der alcoholgist. Amsterdam, Bussy, 1912. 236 p. Bibl. footnotes.
- ASHBY, S. F. Report on the study of fermentation in the manufacture of Jamaica rum. Rept. Jamaica Sugar Expt. Sta. 3: 108-129 (1908-1909). Bibl. on rum and fermentation.
- BAU, ARMINUS. Chemismus der Alkoholgärung. In Lafar, Handb. tech. Mykologie 4: 404-407 (1905-1907).
- BAUDRENEL, A. Bericht ueber die Fortschritte in der Chemie der Gärungsgewerbe, 1914-1915. Z. angew. Chem. 28: 437-440, 455-456 (1915); 140 footnotes. 30: 13-14, 19-24, 28-31 (1917); 210 footnotes.
- BERLIN. Institut für Gärungsgewerbe. Bücherei. Katalog der Bücherei des Instituts für Gärungsgewerbe. Berlin, 1908. 204 p.
- BROWN, ADRIAN G. Colloid chemistry in the fermentation industries. In First report on colloid chemistry, 1917, p. 38-41.
- BUCHNER, EDUARD, and MEISENHEIMER, JAKOB. Die chemischen Vorgänge bei der alkoholischen Gärung. Ber. 43: 1773-1795 (1910). 54 footnotes.
- CZAPEK, F. Die Alkoholgärung. In *his* Biochemie der Pflanzen, 3rd ed., 1: 316-338 (1922). Bibl. footnotes.

- EMMERLING, O. Die neueren Arbeiten auf dem Gebiete der Bakteriengärungen. Biochem. Centr. 9: 397-417 (1910). 202 footnotes.
- EULER, HANS v. Neuere Forschung ueber alkoholische Gärung. Fort. Naturw. Forsch. 10: 93-96 (1914). 125 references.
- "Fermentation and ferments." Ind.-Cat. S. G. O., 1st ser., 4: 651-654 (1883); 2nd ser., 5: 527-531 (1900).
- HAGGLUND, L. E. Hefe und Gärung in ihrer Abhängigkeit von Wasserstoff- und Hydroxylionen. Sammlung chem. chem.-tech. Vorträge 21: 172-174 (1914).
- GREEN, J. REYNOLDS. The soluble ferments and fermentation. 2nd ed. Cambridge, Univ. Press, 1901. 512 p. Bibl., p. 463-504.
- HANOW, H. Fortschritte in der Spiritus und Presshefe Fabrikation. Chem.-Ztg. 25: 1011-1015 (1901); 25 footnotes. 26: 541-545 (1902); 23 footnotes. 27: 357-361 (1903); 34 footnotes. 28: 681-686 (1904); 49 footnotes. 29: 921-925 (1905); 24 footnotes. 30: 1067-1071 (1906); 22 footnotes.
- HARDEN, ARTHUR. Alcoholic fermentation. 3rd ed. New York, Longmans, 1923. 194 p. Bibl., p. 158-189.
- HEINZELMANN, G. Fortschritte und Neuerungen in der Spiritus- und Presshefefabrikation. Chem.-Z. 2: 116-118, 145-148, 176-179 (1903); 56 footnotes. 3: 109-111, 140-143, 640-645 (1903); 65 footnotes.
- JÖRGENSEN, ALFRED. Micro-organisms and fermentation. London, Macmillan, 1900. 318 p. Bibl., p. 277-318. 4th ed., 1911. 489 p.
- KAYSER, EDMOND. Contribution a l'etude des produits volatiles dans la fermentation alcoolique. Ann. sci. agrom. 2: 462-464 (1905).
- KLÖCKER, ALB. Die Gärungsorganismen in der Theorie und Praxis der Alkoholgärungsgewerbe. Stuttgart, Waag, 1900. 318 p. Bibl., p. 280-308.
- KOHL, F. G. Die Hefepilze, ihre Organization, Physiologie, Biologie und Systematik sowie ihre Bedeutung als Gärungsorganismen. Leipzig, Quelle, 1908. 343 p. Bibl. footnotes.
- KOSSOWICZ, ALEX. Einführung in die Mykologie der Gennsmittel und in die Gärungsphysiologie. Berlin, Borntraeger, 1911. 211 p. Bibl., p. 173-196.
- LAFAR, FRANZ. Technical mycology; the utilization of microorganisms in the arts and manufactures. London, Griffin, 1898-1910. 2 vols. Bibl., v. 2: 561-695.

MEISENHEIMER, JAKOB. Ueber die chemischen Vorgänge bei den als Enzymereaktionen erkannten Gärungen. *Biochem. Centr.* 6: 621-633 (1907). 68 references.

MEYER-JACOBSON. Die alkoholische Gärung und die Spiritusbrennerei. *In their* Lehrb. org. Chem. 1, pt. 1: 247-266 (1907). Bibl. footnotes.

MEYERHOF, OTTO. Ueber den Zusammenhang von Atmung und Gärung. *Naturwissenschaften* 7: 259 (1919). 33 references.

MOHR, O. Fortschritte in der Chemie der Gärungsgewerbe. *Z. angew. Chem.* 17: 10-17, 49-51 (1904); 94 footnotes. 18: 569-573, 609-615 (1905); 102 footnotes. 19: 566-569, 619-624 (1906); 108 footnotes. 20: 870-877 (1907); 102 footnotes. 21: 1307-1315 (1908); 106 footnotes. 22: 625-630, 674-676 (1909); 150 footnotes. 23: 916-924 (1910); 150 footnotes. 24: 773-782 (1911); 148 footnotes. 25: 1102-1110 (1912); 130 footnotes. 26: 305-313 (1913); 171 footnotes. 27: 361-368 (1914); 162 footnotes.

"Molasses fermentation." *Sugar* 22: 633-634, 668 (1920). 75 references.

PLIMMER, ROBERT H. A. The chemical changes and products resulting from fermentation. New York, Longmans, 1903. 184 p. Bibl., p. 143-175.

RINCKLEBEN, PAUL. Fortschritte auf dem Gebiete der Gärungsindustrie (Spiritus-Presshefe, Essigfabrikation). *Chem.-Ztg.* 33: 777-778, 786-787 (1909); 74 footnotes. 35: 993-994, 1006-1008 (1911); 93 footnotes.

SADTLER, S. P., and MATOS, L. J. Fermentation industries. *In their* Industrial org. chem., 1923, p. 284-286. Books only.

SCHREIBER, R. Ueber die Fortschritte der Gärungsgewerbe in den Jahren 1911-1913. *Chem.-Ztg.* 38: 629-631 (1914). 47 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Fermentation industries. *In* Reports of the progress of applied chemistry 1: 243-259 (1916); 80 footnotes. 2: 405-448 (1917); 159 footnotes. 3: 403-421 (1918); 102 footnotes. 4: 422-448 (1919); 147 footnotes. 5: 418-449 (1920); 161 footnotes. 6: 446-469 (1921); 149 footnotes. 7: 414-440 (1922); 116 footnotes. 8: 456-488 (1923); 116 footnotes. 9: 475-513 (1924); 223 footnotes.

VANDVELDE, A. J. J. Etudes sur la fermentation panaiere. *Rev. gen. chim. pure appl.* 16: 53-61, 86-95, 123-130, 136-141 (1913). Bibl. footnotes.

Serial

Jahresbericht über die Fortschritte in der Lehre von den Gärungsorganismen und Enzymen. 1890-. Classified: Books, apparatus, morphology of bacteriology and yeasts; general physiology of bacteria; fermentation; alcoholic, lactic; nitrification; enzymes. Bibl., followed by abstracts of the most important articles.

See also ALCOHOL, ENZYMES, ETHYL ALCOHOL, YEASTS.

FERROALLOYS. See IRON, ALLOYS.

FERROMANGANESE. See IRON, ALLOYS.

FERROSILICON. See IRON, ALLOYS.

FERTILIZERS

(Includes action of chemicals on plants.)

BAUER, F. C. Relation of organic matter and the feeding power of plants to the utilization of rock phosphate. *Soil Science* 12: 21-41 (1921). 45 references.

BROWN, P. E., and STALLINGS, J. H. Inoculated legumes as nitrogenous fertilizers. *Soil Science* 12: 365-407 (1921). 46 references.

BUCKMAN, H. O. Moisture and nitrate relations in dry land agriculture. *Proc. Am. Soc. Agron.* 2: 121-138 (1910). 27 footnotes.

CAMERON, FRANK E., et al. Preliminary report on the fertilizer resources of the United States. U. S., 62nd Congr., Senate Doc. No. 190. 1912. Reference list for phosphates, p. 78-106. Reference list of papers concerning the economic uses of algae and concerning the salts derived from ashes, p. 271-276. Reference list to the literature of the marine algae, p. 277-290.

COLLINS, S. HOARE. Chemical fertilizers and parasiticides. London, Bailliere, 1920. 273 p. Bibl. at end of chapters.

COLLINS, SIDNEY H. Plant products and chemical fertilizers. London, Bailliere, 1918. 236 p. Bibl. at end of chapters.

CURTIS, OTIS F. Stimulation of root growths in cuttings by treatment with chemical compounds. *Cornell Univ. Agr. Expt. Sta., Mem. No.* 14: 135-138 (1918). Also, Thesis, Cornell Univ., 1916.

DICKSON, JAMES G. Value of certain nutritive elements in the development of the oat plant. *Am. J. Bot.* 5: 323-324 (1918).

DUDLEY, F. L., and MILLER, M. F. Effect of a varying supply of nutrients upon the character and composition of the maize plant at different

FERTILIZERS—Cont'd

periods of growth. Mo. Agr. Expt. Sta., Research Bull. No. 42: 1-66 (1921).

DUGGAR, B. M. Hydrogen ion concentration and the composition of nutrient solutions in relation to the growth of seed plants. *Annals Mo. Bot. Gardens* 7: 47-49 (1920). 46 references.

GREAVES, J. E., and CARTER, E. G. Influence of barnyard manure and water upon the bacterial activities of the soil. *J. Agr. Res.* 6: 923-926 (1916).

GREAVES, J. E., and CARTER, E. G. Action of some common soil amendments. *Soil Science* 7: 121-160 (1919). 165 references.

GUTHRIE, F. B. The relation of fertilizers to soil fertility. Dept. Agr., N. S. Wales, Sci. Bull. No. 9, 1913. 34 p. Bibl., p. 20-34.

HALLIGAN, JAMES H. Soil fertility and fertilizers. Easton, Chem. Pub. Co., 1912, 397 p. Bibl., p. 386-388.

HATFIELD, WM. D. The fertilizer value of activated sludge. Ill. State Water Survey, Bull. No. 16, 91-139 (1918-19); Thesis, Univ. Ill., 1918. 53 p. Bibl., p. 51-53. 43 references.

HILL, H. H. Study of the influence of the lime-magnesia ratio on soils under continuous cultivation. Va. Agr. Expt. Sta., Tech. Bull. No. 24, 1922. 15 p.

HILLS, JOSEPH L. Manufacture of commercial fertilizers. Vt. Agr. Expt. Sta., Bull. No. 207, 1917. 48 p. Bibl., p. 46-48.

INTERNATIONAL INSTITUTE OF AGRICULTURE. International movement of fertilizers and chemical products useful to agriculture. No. 1, 1914, p. 40-44; No. 2, 1915, p. 44-50; No. 3, 1915, p. 29-36; No. 4, 1916, p. 37-47; No. 5, 1916, p. 64-76; No. 6, 1917, p. 62-72; No. 7, 1918, p. 57-86. *See also* Bull. Agr. Intelligence 5: 1101-1142 (1914); 6: 323-370 (1915); 178 references. 6: 499-532 (1915); 305 references. Intern. Crop Rept. and Agr. Statistics 7: 177-221 (1916). 445 references. 8: 298-308 (1917).

KEARNEY, T. H., and CAMERON, F. K. The effect upon seedling plants of certain components of alkali soils. U. S. Dept. Agr., Rept. No. 71, 1902. Bibl., p. 56-60.

LATHROP, ELBERT C. The organic nitrogen compounds of soils and fertilizers. *J. Franklin Inst.* 183: 489-498 (1917). About 200 references.

LIPMAN, C. B. A critique of the hypothesis of the lime magnesia ratio.

Plant World 19: 83-105, 119-135 (1916).

MCTAGGART, ALEXANDER. The influence of certain fertilizers on the growth and nitrogen content of some legumes. *Soil Science* 11: 452-454 (1921); Thesis, Cornell Univ., 1921. 61 references.

"Manures." Ind.-Cat. S. G. O., 1st ser., 8: 558 (1887); 2nd ser., 10: 117-118 (1905).

MARAIS, JACOBUS S. Comparative agricultural value of insoluble mineral phosphates of aluminium, iron and calcium. *Soil Science* 13: 396-400 (1922). 85 references.

PIETERS, A. J. Green manuring, a review of the American Experiment Station literature. *J. Am. Soc. Agron.* 9: 173, 183-190 (1917). Arranged by States.

TOTTINGHAM, W. E. Preliminary study of the influence of chlorides on the growth of certain agricultural plants. *J. Am. Soc. Agron.* 11: 1-32 (1919). 80 references.

VAGELER, HANS. Ein Beitrag zur Frage der Wirkung von Mangan, Eisen und Kupfer auf den Pflanzenwuchs. *Lands. vers. Stat.* 88: 232-241 (1916).

WARNEBOLD, HEINRICH. Zur Kenntniss der Wirkung starker Düngesalzgaben auf die Entwicklung und den Bau der Pflanzen. *Landw. Jahrb.* 49: 332-333 (1916).

WICHERN, G. Bericht über die Fortschritte der Düngemittelindustrie in den Jahren 1913-1920. *Chem.-Ztg.* 45: 3-4, 57-58, 81-82, 110-111, 129-131 (1921). 140 footnotes.

WYATT, F. A. Influence of calcium and magnesium compounds on plant growth. *J. Agr. Res.* 6: 589-619 (1916). 42 references.

Serial

Zeitschrift für Pflanzenernährung und Düngung. 1922-. . . Wissenschaftlicher Teil und Wirtschaftlich-Praktischer Teil. Each contains "Referate," which are classified.

See also AGRICULTURAL CHEMISTRY, GYPSUM, MARL, PHOSPHATES, SOILS, THOMAS SLAG.

FERTILIZERS: Alkali salts.

HARRIS, FRANK S. Effect of alkali salts in soils on the germination and growth of crops. *J. Agr. Res.* 5: 1-54 (1915). 26 references.

FERTILIZERS: Amino acids.

SCHREINER, OSWALD, and SKINNER, J. J. Specific action of organic compounds in modifying plant characteristics: methylglycocoll versus gly-

cocoll. Bot. Gaz. 59: 445-463 (1915). 18 footnotes.

FERTILIZERS: Ammonium sulfate.

WOLKOFF, M. I. The influence of ammonium sulfate on the germination and the growth of barley in sand and soil cultures kept at different moisture contents and at various osmotic concentrations of the soil solution. Soil Science 5: 468-478 (1918). 270 references.

FERTILIZERS: Arsenic.

GREAVES, J. E. Stimulating influence of arsenic upon the nitrogen fixing organism of the soil. J. Agr. Res. 6: 389-416 (1916). 44 references.

FERTILIZERS: Copper salts.

FORBES, ROBERT H. Certain effects under irrigation of copper compounds upon crops. Univ. Calif. Pub., Agr. Sci., 1, No. 12: 487-489. 1917.

FERTILIZERS: Gypsum.

CROCKER, W. M. The history of agricultural gypsum. Chicago, Gypsum Industries Assoc., 192—. 36 p. Bibl., p. 35-36.

FERTILIZERS: Iron sulfate.

HORTON, HORACE E. A contribution to the bibliography of the use of sulfate of iron in agriculture. Chicago, Am. Steel and Wire Co., 1906. 71 p. p. 70-71 give references up to 1909. 452 references.

WIESSMANN, H. Düngungsversuche mit Eisensulfat. Landw. Jahrb. 55: 281-286 (1920). Bibl. footnotes.

FERTILIZERS: Lime.

KOPELOFF, NICHOLAS. Influence of fineness of division of pulverized limestone on crop yield as well as the chemical and bacteriological factors in soil fertility. Soil Science 4: 19-67 (1917). 124 references.

MACINTIRE, WALTER H. Carbonation of burnt lime in soils. Soil Science 7: 325-446 (1919). 73 references.

FERTILIZERS: Magnesia.

MEYER, DIEDRICH. Die Kalk und Magnesiadüngung. Berlin, Parey, 1910. 108 p. Bibl. footnotes.

STROHMER, F., and FALLADA, O. [Magnesia fertilizer for sugar beets.] Oesterr-ungar. Z. Zuckerind. Landw. 42: 221-231 (1913).

FERTILIZERS: Manganese.

KELLEY, W. P. The function of manganese in plants. Bot. Gaz. 57: 226-227 (1914). 20 titles.

McHARGUE, JAMES S. Effect of different concentrations of manganese sulfate on the growth of plants in acid and neutral soils and the necessity of manganese as a plant nutrient. J. Agr. Res. 24: 793-794 (1923).

FERTILIZERS: Nitrogen compounds.

BEAR, FIRMAN E. Nitrogen economy in soils. J. Am. Soc. Agron. 14: 151-152 (1922). 35 references.

PETRIE, J. M. The rôle of nitrogen and its compounds in plant metabolism. Proc. Linn. Soc. N. S. Wales 33: 801-844 (1908). 100 references.

STUNTZ, STEPHEN C. Reference list on the electric fixation of atmospheric nitrogen and the use of calcium cyanamid and calcium nitrate on soils. U. S. Dept. Agr., Bur. Soils, Bull. No. 63, 1910. 89 p.

See also NITROGEN FIXATION.

FERTILIZERS: Phosphates.

BURLISON, W. L. Availability of mineral phosphates for plant nutrition. J. Agr. Res. 6: 513-514 (1916). 32 references.

GUTBIER, A. Phosphate - Verwendung zu Düngezwecken. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 158-160 (1911).

MARAIS, J. S. The comparative agricultural value of insoluble mineral phosphates of aluminium, iron and calcium. Soil Science 13: 396-400 (1912).

ROBERTSON, GEORGE S. Basic slags and rock phosphates. Cambridge, Univ. press, 1922. 120 p. Bibl., p. 108-109.

See also CALCIUM PHOSPHATES.

FERTILIZERS: Potassium compounds.

DE TURK, E. Potassium bearing minerals as a source of potassium for plant growth. Soil Science 8: 299-301 (1919). 69 references.

HALEY, DENNIS E. The availability of potassium in orthoclase for plant nutrition. Soil Science 15: 179-180 (1923).

NOLTE, OTTO. Ueber die Wirkung der Kali-Endaugen auf Boden und Pflanze. Landw. Jahrb. 51: 563-672 (1918). Bibl. footnotes.

SMITH, RAYMOND S. Some effects of potassium salts on soils. Cornell Univ. Agr. Expt. Sta., Mem. No. 35: 602-605 (1920).

STOKLASA, JULIUS, and MATOUŠEK, ALOIS. Beiträge zur Kenntniss der Ernährung der Zuckerrübe. Physiologische Bedeutung des Kaliumions im Organismus der Zuckerrübe. Jena, Fischer, 1916. 230 p. Bibl., p. 220-227.

FERTILIZERS: Smelter Waste.

LIPMAN, C. B., and GERICKE, W. F. Effects of constituents of solid smelter wastes on barley growth in pot cultures. Univ. Calif., Pub. Agr. Sci. 1, No. 13: 495-587 (1917). 126 footnotes.

FERTILIZERS: Sodium chloride.

LOMANITZ, S. Influence of sodium chloride upon alfalfa grown in solution cultures. *Soil Science* 18: 365-368 (1924). 89 references.

FERTILIZERS: Sodium nitrate.

COLEMAN, DAVID A. Influence of sodium nitrate upon nitrogen transformation in soils with special reference to its availability and that of other nitrogenous manures. *Soil Science* 4: 345-432 (1917). 226 references.

FERTILIZERS: Sulfur.

AMES, J. W., and BOLTZ, G. E. Sulfur in relation to soils and crops. *Ohio State Agr. Expt. Sta., Bull. No. 292*, 1916. Bibl., p. 255. 25 references.

FEILITZEN, H. VON. [On the use of sulfur for the prevention of potato scab and as an indirect fertilizer.] *K. Landtbr. Akad. Handl. och Tidskr.* 52: 120-130 (1913).

LOMANITZ, S. The needs of the soils of Brazos and Jefferson counties for sulfur. *Texas Agr. Expt. Sta. Bull. No. 302*: 5-23 (1922). 57 references.

MILLER, H. G. Relation of sulfates to plant growth and composition. *J. Agr. Res.* 17: 87-102 (1919). 26 references.

OLSON, GEORGE A., and ST. JOHN, J. L. An investigation of sulfur as a plant food. *State College of Washington, Agr. Expt. Sta., Bull. No. 165*, 1921. 69 p. Bibl., p. 55-69. Also in *Iowa Geol. Sur.*, 28: 514-536. 254 references.

PETERSON, WM. H. Forms of sulfur in plant materials and their variation with the soil supply. *J. Am. Chem. Soc.* 36: 1300 (1914). 24 references.

REIMER, FRANK C. Sulfur as a fertilizer for alfalfa in southern Oregon. *Oregon Agr. Expt. Sta., Bull. No. 163*, 1919. 40 p. Bibl., p. 39-40.

SHEDD, O. M. The relation of sulfur to soil fertility. *Ky. Agr. Expt. Sta., Bull. No. 188*, 595-630 (1914).

WOODWARD, JOHN. Sulfur as a factor in soil fertility. *Bot. Gaz.* 73: 106-109 (1922). Thesis, Univ. Chicago, 1922.

FIBERS

FLEISCHER, HERTHA. Verzeichnis der Aufschliessungsverfahren von Faserstengeln. *Faserforschung* 2: 63-69 (1922). 116 patents on retting and digesting of fibers. Subject index.

GARÇON, JULES. Bibliographie de la technologie chimique des fibres textiles; propriétés—blanchiment—teinture—matières—colorantes. *Strasbourg, Fischbach*, 1893. 170 p.

GEORGIEVICS, GEORG C. T. VON. *Lehrbuch der chemischen Technologie der Gespinnstfasern*. Leipzig, 1913. 2 vols. Bibl., vol. 1: 527-553.

HARRISON, W. Colloid chemistry in the textile industry. In *Second report on colloid chemistry*, 1918, p. 52-69; *J. Soc. Dyers Colourists* 35: 243-254 (1919); *Color Trade J.* 6: 50-55, 91-95 (1920). Discusses cotton, mercerized cotton, oxycellulose, cellulose, hydrocellulose, cellulose esters, artificial silk, etc.

LOWENTHAL, RICHARD. Neuerungen auf dem Gebiete der chemischen Technologie der Spinnfasern. *Chem.-Ztg.* 26: 752-755 (1902); 70 footnotes. 27: 448-450 (1903); 58 footnotes. 28: 295-297 (1904); 19 footnotes. 30: 629-631 (1906); 43 footnotes. 33: 753-755, 770-772 (1909); 100 footnotes. 36: 777-779, 822-824, 831-833 (1912); 153 footnotes. 39: 669-670, 695-698 (1915); 137 footnotes. 43: 709-711, 719-720, 729-731 (1919); 122 footnotes.

MASSOT, W. Fortschritte auf dem Gebiete der Faser- und Spinnstoffe. *Z. angew. Chem.* 17: 854-866 (1904); 65 footnotes. 18: 1042-1047, 1089-1098 (1905); 59 footnotes. 19: 737-748 (1906); 78 footnotes. 20: 437-444, 484-490 (1907); 60 footnotes. 21: 340-354 (1908); 107 footnotes. 22: 241-252, 299-304 (1909); 123 footnotes. 24: 433-444 (1911); 88 footnotes. 25: 562-574, 613-616 (1912); 127 footnotes. 26: 257-271 (1913); 121 footnotes. 28: 49-54, 59-64, 65-73 (1915); 132 footnotes. 29: 49-54, 63-68 (1916); 72 footnotes. 30: 73-76, 82-85, 96-99, 103-104 (1917); 99 footnotes.

MATTHEWS, J. MERRITT. *The textile fibers*. 4th ed. New York, Wiley, 1924. 1053 p. Bibl., p. 1021-1034. 600 references.

RICHTER, OSWALD. [Distribution of iron in technically important fibers and its importance for analytical purposes.] *Faserforschung* 2: 189-225 (1922).

SOCIETY OF CHEMICAL INDUSTRY. *Fibers, textiles, cellulose and paper*. In *Annual reports of the progress of applied chemistry* 1+ . 1916 to date. Bibl. footnotes.

STIRM, KARL. *Chemische Technologie der Gespinnstfasern*. Berlin, Borntraeger, 1915. 410 p. Bibl., p. 381-383; patents, p. 384-390.

SÜVERN, K. Faser- und Spinnstoffe in den Jahren 1917 und 1918. *Z. angew. Chem.* 32: 115-120 (1919). 97 footnotes.

- WEST, CLARENCE J. Papermaking materials. Bibl. Series, A. D. Little, Inc., Cambridge, Mass., No. 6, 1920-1921. 170 p. Reprinted from Paper Trade J. Classified by botanical names.
See also CELLULOSE, PAPER, SILK, TEXTILES, WOOL, ETC.
- FIBRIN**
 "Fibrin." Ind.-Cat. S. G. O., 1st ser., 4: 962-963 (1883); 2nd ser., 5: 772-773 (1900).
 GRAM, H. C. New method for the determination of the fibrin percentage in blood and plasma. J. Biol. Chem. 49: 279 (1921). 33 references.
 SAMUELY, FRANZ. Fibrin. In Abderhalden, Biochem. Handl. 4: 99-102 (1911). Bibl. footnotes.
- FIG**
 EISEN, G. The fig: its history, cultivation and curing. U. S. Dept. Agr., Div. Pomology, Bull. No. 9, 1901. 317 p. 173 references.
- FILLERS.** *See* CLAYS; PAPER, FILLERS.
- FILMS**
 MARSCHALK, J. Die Herstellung von Films. Kunststoffe 7: 108-110 (1917). 23 patents.
See also CELLULOSE ESTERS.
- FILTER PAPER.** *See* PAPER.
- FILTERS AND FILTRATION**
 BÜHLER, F. A. Filters and filter presses for the separation of liquids and solids. London, Rodger, 1914. 184 p. Patents, 1901-1913, p. 168-179.
 WOLLASTON, THOMAS R. Filtration, an elementary treatise. London, Pitman, 1922. 102 p. Bibl., p. 100.
See also DRYERS and DRYING (Alliott).
- FIREWORKS.** *See* PYROTECHNICS.
- FISH**
 BEARD, H. R. Bibliography of chemical literature pertaining to the fish industry. Calif. Fish and Game 7: 256-260 (1922). Selected list of U. S. and foreign literature.
 CLARK, E. D., and ALMY, L. H. Composition of common food fishes. J. Biol. Chem. 33: 483 (1918). 24 references.
 KÖNIG, J., and SPLITTGERBER, A. Die Bedeutung des Fischfleisches als Nahrungsmittel. Z. Nahr. Genussm. 18: 497-537 (1909). Bibl. footnotes.
 MACDONALD, ROSE M. E. An analytical subject bibliography of the publications of the Bureau of Fisheries, 1871-1920. Rept. U. S. Commissioner Fisheries, 1920. Appendix v (Bureau of Fisheries No. 899). Chemical topics, p. 285-288.
 TRESSLER, DONALD K. Marine products of commerce; their acquisition, handling, biological aspects and the science and technology of their preparation and preservation. New York, Chem. Cat. Co., 1923. 762 p. Bibl. at end of most of the chapters.
- FLAME REACTIONS**
 BANCROFT, W. D., and WEISER, HARRY B. Flame reactions. J. Phys. Chem. 18: 213-263 (1914). Bibl. footnotes.
- FLASH POINT.** *See* GASOLINE, KEROSENE, PETROLEUM.
- FLAVONE**
 KOSTANECKI, ST. DE. Les synthèses dans les groupes de la flavone et de la chromone. Bull. soc. chim. (3) 29: i-xxxvii (1903). Bibl. footnotes and references through text.
 MEYER-JACOBSON. Flavon. In their Lehrb. org. Chem. 2, pt. 3: 737-752 (1917). Bibl. footnotes.
See also PLANT PIGMENTS.
- FLAX**
 BROSCHE, ANTON. Der Flachs in der Fachliteratur, mit einer Einführung in die Geschichte der deutschen Flachswirtschaft und einem Anhang mit Bauernregeln, Sprichwörtern und Sagen über der Flachsbaum. Berlin, 1922. 86 p.
See also FIBERS.
- FLOCCULATION**
 FREE, E. Flocculation and deflocculation. J. Franklin Inst. 170: 54-57 (1910). 60 references.
 KRUYT, H. R., and SPEK, J. VAN DER. Zur Kenntniss des Flockungsvorganges. Kolloid-Z. 25: 1-20 (1919). 46 footnotes.
See also COLLOIDS.
- FLOTATION**
 ADAM, R. H. Résumé de littérature on the theory of flotation with critical notes. Mining Sci. Press 121: 765-770 (1920). Also in Rickard, Concentration by flotation, 1921.
 COGHILL, W. H. Molecular forces and flotation. Mining Sci. Press 116: 747-753 (1918).
 CRAVER, H. W. Bibliography on flotation. New York, Engineering Soc. Library, 1921. 62 p. Typewritten. Covers 1910-1921. 449 references.
 CUNNINGHAM, JESSE. List of references on concentrating ores by flotation. Mo. School Mines Met., Bull., 8: No. 1: 11-90 (1916); 903 references. In part in Trans. Am. Inst. Mining Eng. 55: 539-544 (1916).
 EDSER, EDWIN. The concentration of minerals by flotation. In Fourth report on colloid chemistry, 1922, 263-326. About 100 footnotes.
 FAHRENWALD, ARTHUR W. Differential flotation. Idaho, Bur. Mines Geol., Pamphlet No. 4, 1921. 23 p. Bibl. footnotes.

FLOTATION—Cont'd

- HOOPER, THEODORE JESSE. Concentrating ores by flotation, being a description and history of a recent metallurgical development, together with a summary of patents and litigation. 3rd ed. London, Mining Mag., 1916. 320 p. Bibl., p. 201-254, covering 1900-1913; 2500 references; p. 290-312, covering 1914-1916; 600 references.
- LEWIS, R. S., and RALSTON, O. C. Patents relating to oil-flotation processes. Utah Eng. Expt. Sta., Dept. Metal. Res., Bull. No. 8, 1916. 50 p. Annotated. Extension of Cunningham's bibl.
- LYON, D. A., RALSTON, O. C., LANEY, F. B., and LEWIS, R. S. Bibliography on recent literature on flotation. U. S. Bur. Mines, Tech. Paper No. 135, 1917. 17 p. Covers Jan.-June, 1916. Tech. Paper No. 176, 1917. 27 p. July-Dec., 1916.
- RALSTON, O. C. Preferential flotation. Mining Sci. Press 110: 980-984 (1915). Largely patents.
- STANDER, HENRICUS J. The flotation process. Chicago, Mining World, 1916. 175 p. Bibl., p. 148-167. Patents, 119-147.
- VAGELER, PAUL. Die Schwimmaufbereitung der Erze. Dresden, Steinkopff, 1921. 98 p. German patents on flotation, p. 88-98.
- FLOUR**
- COLLATZ, FERDINAND A. Flour strength as influenced by the addition of diastatic ferments. Thesis, Univ. Minnesota, 1922. 74 p. Bibl., p. 63-72.
- "Flour and its adulterations." Ind.-Cat. S. G. O., 1st ser., 5: 16 (1884); 2nd ser., 5: 867-868 (1900).
- KEENAN, GEORGE L., and LYONS, MARY A. The microscopical examination of flour. U. S. Dept. Agr., Bull. No. 839, 1920. 32 p. 22 references. (Revised, Aug., 1922.)
- LOVE, E. G. Bibliography on the adulteration and examination of cereal products and accessories of flour and bread foods. In 2nd annual rept. N. Y. State Board of Health, 1882, p. 584-589.
- MONIER-WILLIAMS, G. W. On the chemical changes produced in flour by bleaching. Repts. Local Government Boards (Gt. Brit.), Pub. Health and Med. Subjs., n. s., 1911, No. 49: 34-65.
- RUMSEY, LOUYS A. The diastatic enzymes of wheat flour and their relation to flour strength. Thesis, Univ. Minnesota, 1922. Am. Inst. Baking, Bull. No. 8, 1922. 86 p. Bibl., p. 75-84.
- SHARP, PAUL F., and GORTNER, ROSS A. Viscosity as a measure of hydration capacity of wheat flour and its relation to baking strength. Univ. Minn., Agr. Expt. Sta., Tech. Bull. No. 19, 1923. 119 p. Bibl., p. 104-119.
- See also* FOODS.
- FLUIDITY. See PLASTICITY.**
- FLUORESCENCE**
- DOBBIE, J. J., *et al.* List of organic compounds "of which the fluorescence or phosphorescence has been measured." Rept. Brit. Assoc. Sci., 1916: 812-816.
- HEWITT, JOHN T. Ueber die Beziehung zwischen der Konstitution und der Fluoreszenz einiger Substanzen. Z. physik. Chem. 34: 1-19 (1900). Bibl. footnotes.
- KAUFFMANN, HUGO. Ueber Fluoreszenz. Jahrb. Radioakt. Elektronik 1: 339-344 (1904). Bibl. footnotes.
- KAUFFMANN, HUGO. Die Beziehungen zwischen Fluoreszenz und chemischer Konstitution. Sammlung chem. chem.-tech. Vorträge 11: 1-102 (1906). Bibl. footnotes.
- KONEN, H. Fluoreszenz. In Kayser, Handb. der Spectroscopie 4: 841-1214 (1908). Bibl. footnotes.
- PRINGSHEIM, PETER. Fluoreszenz und Phosphoreszenz im Lichte der neueren Atomtheorie. 2nd ed. Berlin, Springer, 1923. 228 p. About 325 references.
- STEVENSON, LOUISA S. Fluorescence of anthracene. J. Phys. Chem. 15: 864-865 (1911). 42 references.
- See also* LUMINESCENCE, PHOSPHORESCENCE.
- FLUORESCIN**
- LIEBIG, HANS V. Ueber Fluorescein. J. prakt. Chem. 193: 97-136, 241-284 (1912); 194: 472-516 (1912). Bibl. footnotes.
- LIEBIG, HANS V. Ueber Fluorescein-äther und -ester. J. prakt. Chem. 196: 26-48 (1913). Bibl. footnotes.
- See also* DYES.
- FLUORINE**
- ARGO, W. L., *et al.* Preparation of fluorine. Trans. Am. Electrochem. Soc. 35: 335-345 (1919); J. Phys. Chem. 23: 348-355 (1919). 15 footnotes.
- DITZ, HUGO. Fluor. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 1-13 (1909). References through text.

- JOLY, A. Fluor. *In* Frémy, Enc. chim. 2, 1^e cahier: 714-715 (1885).
- KÖRZ, A. Fluor. *In* Abegg, Handb. anorg. Chem. 4, pt. 2: 46-49 (1912). 136 references.
- LÖBL, H. Fluor und seine Verbindungen. *In* Bräuer and d'Ans, Fortschritte, 1: 378-379 (1921). German patents.
- MARTIN, G., and DANCATER, E. A. Fluorine. *In* Friend, Textbook, 8: 22-50 (1915). Bibl. footnotes.
- MELLOR, J. W. Fluorine. *In* his Inorg. theor. chem. 2: 1-15 (1922). Occurrence, 50 references; history, 60 references; properties, 50 references.
- MOISSAN, HENRI. Fluor et ses composés. Paris, Steinheil, 1900. 396 p. Bibl. of about 600 references, p. 305-390. Also German edition.
- MOISSAN, HENRI. Fluor. *In* his Chim. min. 1: 64-86 (1904). 167 footnotes.
- RUFF, OTTO. Chemie des Fluors. Berlin, Springer, 1920. 136 p. Bibl. of 307 references, p. 129-133.
- FLUORINE: Analytical.**
- ADOLPH, WM. H. The quantitative methods for fluorine. Thesis, Univ. Pa., 1915. 30 p. Bibl., p. 4-6.
- DITZ, HUGO. Fluor—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 32-40, 410-411 (1909).
- WAGNER, C. R., and ROSS, W. H. Modified method for the determination of fluorine with special reference to the analysis of phosphates. *J. Ind. Eng. Chem.* 9: 1116-1123 (1917). 47 references.
- FLUORSPAR**
- ALLEN, MILTON A. Fluorspar. Arizona, Bur. Mines, Bull. No. 114, 1921. 19 p. Bibl., p. 18-19.
- AURAND, H. A. Fluorspar deposits of Colorado. Colo. Geol. Sur., Bull. No. 19, 1920. Bibl., p. 87-91. 69 references.
- BURCHARD, E. F. Fluorspar and cryolite. U. S. Geol. Sur., Mineral Resources, 1916, pt. 2: 324-325. 31 references.
- DAVIS, HUBERT W. Fluorspar and cryolite in 1919. U. S. Geol. Sur., Mineral Resources, 1919, pt. 2: 367-368 (1921). 40 references.
- GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period (1913-1919). Fluorspar. 1921. 18 p. Bibl., p. 16-18.
- FOODS**
- ABDERHALDEN, EMIL, and SCHAU-MANN, H. Beitrag zur Kenntniss von organischen Nahrungstoffen mit spezifischer Wirkung. Arch. ges. Physiol. 172: 1-275 (1918). Bibl. footnotes.
- BAIER, ED. Die Chemie der Nahrungs- und Genussmittel in den Jahren 1919-1921. Chem.-Ztg. 46: 705-706, 725-727, 750-751, 813-815, 837-840, 890-891, 905-907 (1922). 423 footnotes.
- BUCHKA, K. v. Bericht ueber die Fortschritte der Nahrungsmittelchemie in Jahre 1902. Chem.-Ztg. 27: 515-521 (1903). 76 footnotes.
- BUCHKA, KARL H. v. Das Lebensmittelgewerbe, ein Handbuch für Nahrungsmittelchemiker, usw. Leipzig, 1914-1919. 4 vols. Bibl. footnotes.
- CLATWORTHY, LINDA M., and HUNT, LELIA W. Bibliography of food economy for the housewife. State College of Washington, Library Bull. No. 5, 1918. 52 p. Classified by kinds of foods.
- COHN, R. Nahrungsmittelchemie. Fortschritte Chem. 14: 114-147 (1918-1919). References through text.
- COLBEY, ALBERT L. Catalogue of the literature of the chemistry of food and drugs. 2nd Annual Rept. State Board of Health, N. Y., 1882, p. 705-715.
- COUTTS, F. J. H. On the use of proprietary foods for infant feeding. Repts. Local Govt. Bd. (Gt. Brit.). Pub. Health Med. Subjects, n. s., No. 80: 3-49 (1914).
- FENDLER, G. Die Nahrungsmittelchemie, 1902-1909. Z. angew. Chem. 17: 650, 678, 711, 744 (1904); 237 footnotes. 18: 641-648, 692-695 (1905); 44 footnotes. 21: 721-732, 769-777 (1908); 350 footnotes. 22: 827-834, 867-872 (1909); 176 footnotes. 23: 673-684 (1910). 188 footnotes.
- FITCH, WM. EDWARD. Dietotherapy. Chemistry and physiology of digestion. Classification and analysis of foods. 2nd ed. Vol. 1. New York, Appleton, 1922. 816 p. Contains bibl. "Food." Ind.-Cat. S. G. O., 1st ser., 5: 51-64 (1884); 2nd ser., 5: 904-922 (1900). Includes adulteration and inspection, preservation and food as cause of disease.
- GEORG, KARL. Verzeichnis der Litteratur ueber Speise und Trank, bis zum Jahre 1887. Hannover, Klindworth, 1888. 131 p. 1704 titles, classified, with author index.
- HARVEY, LUCILE S. Food facts for the home maker. Boston, Houghton Mifflin, 1920. 314 p. Bibl. p. 295-314.

FOODS—*Cont'd*

- HÜBNER, O. Nahrungsmittelchemie. Fortschritte Chem. 1: 157-160, 207-213, 347-351 (1909); 2: 83-89 (1910); 3: 115-122 (1910-1911); 4: 95-102 (1911). References through text.
- "International trade in feeding stuffs." Bull. Bur. Agr. Intelligence 8: 529-551 (1917).
- KÖNIG, J. Chemische Zusammensetzung der menschlichen Nahrungs- und Genussmittel. 4th ed. Berlin, Springer. Vol. 1, 1903, 1535 p. Vol. 2, 1904, 1557 p. Nachtrag A. Zusammensetzung der tierischen Nahrungs- und Genussmittel. By J. Grossfeld, A. Splittgerber and W. Sutthoff. 1919. 594 p. Nachtrag B. Zusammensetzung der pflanzlichen Nahrungs- und Genussmittel. By Grossfeld and Splittgerber. 1923. 1216 p. Bibl. footnotes.
- KÖNIG, J. Untersuchungen von Nahrungs-, Genussmitteln und Gebrauchsgegenständen. Berlin, Springer, 1910-1918. Vol. 3 of *his* Chemische Zusammensetzung. In 3 parts. Bibl. footnotes.
- KUTTENKEULER, H. Jahresbericht ueber die Fortschritte der Chemie der Nahrungs- und Genussmittel, 1906-1918. Chem.-Ztg. 31: 1239, 1254, 1268 (1907); 132 footnotes. 32: 693, 709, 720 (1908); 129 footnotes. 33: 505, 514, 523, 530 (1909); 183 footnotes. 34: 426, 437 (1910); 178 footnotes. 35: 322, 338, 347 (1911); 176 footnotes. 36: 565, 585, 602 (1912); 180 footnotes. 37: 1033, 1058, 1075, 1087 (1913); 277 footnotes. 38: 1229, 1251, 1281 (1914); 249 footnotes. 40: 789, 799, 819, 843, 861 (1916); 510 footnotes. 41: 681, 700, 714 (1917); 245 footnotes. 43: 841, 853, 869, 889 (1919); 373 footnotes.
- LANGWORTHY, C. F. Cost and nutritive value of foods. Trans. 15th. Intern. Congr. Hygiene 2, sect 2: 550-573 (1912). 229 references.
- LIST, E. Fortschritte auf dem Gebiete des Weines und der Nahrungsmittel. Chem.-Ztg. 24: 817-818, 832-835 (1900); 85 footnotes. 25: 1032-1035 (1901); 90 footnotes.
- MCCOLLUM, E. V. The newer knowledge of nutrition. 2nd ed. New York, Macmillan, 1922. 449 p. Bibl. at end of chapters.
- "Milk as food." Ind.-Cat. S. G. O., 1st ser., 9: 304-306 (1888); 2nd ser., 10: 880-882 (1905).
- POTT, E. Handbuch der tierischen Ernährung und der landwirtschaftlichen Futtermittel. 2nd ed. 1904-1909. 3 vols.
- OPPENHEIMER, K., and COHN, R. Nahrungsmittelchemie. Fortschritte Chem. 5: 207-216 (1912); 7: 137-147 (1913).
- RICHARDS, ELLEN H. The cost of food. 3rd ed. New York, Wiley, 1917. 148 p. Bibl., p. 138-141.
- ROTHENFIESSER, S. Die Nahrungsmittelchemie im Jahre 1910. Z. angew. Chem. 25: 241-250, 293-302 (1912). 198 footnotes.
- ROUSSET, H., and CHAPLET, A. Les métiers et les industries de l'alimentation. Paris, Delagrave, 1922. 308 p. Bibl. at end of chapters.
- RÜHLE, J. Die Nahrungsmittelchemie in den Jahren 1911-1916. Z. angew. Chem. 25: 2203-2208, 2244-2252 (1912); 187 footnotes. 26: 331-343 (1913); 223 footnotes. 27: 617-624, 625-630 (1914); 262 footnotes. 28: 397, 405, 416, 431 (1915); 221 footnotes. 29: 209, 213, 223 (1916); 300 footnotes. 30: 253, 261, 271, 280 (1917); 330 footnotes. 32: 9, 17, 27, 36 (1919); 346 footnotes.
- SAVAGE, W. G. Report to the local government board on bacterial food poisoning and food infections. Rept. Local Govt. Bd., (Gt. Brit.), Pub. Health Med. Subjs., n. s., No. 77, 1913. 80 p.
- SOCIETY OF CHEMICAL INDUSTRY. Foods. In Reports of the progress of applied chemistry. 3: 386-416 (1918); 4: 449-464 (1919); 5: 450-470 (1920); 6: 490-497 (1921); 7: 441-459 (1922); 8: 489-504 (1923); 9: 514-532 (1924). Bibl. footnotes.
- "Sugar as food." Ind.-Cat. S. G. O., 2nd ser., 17: 18-19 (1912).
- TANNER, FRED W. Bacteriology and mycology of foods. New York, Wiley, 1919. 590 p. Disinfection, p. 177-181; yeasts, p. 226-227; water, p. 356-362; milk, p. 440-450; eggs, p. 471-478; meat, p. 491-493; food preservation, p. 535-539.
- THOMPSON, W. H. The food value of Great Britain's food supply. Econ. Proc. Royal Dublin Soc. 2: 168-220 (1916).
- U. S. Department of Agriculture. Food and nutrition investigations of the Office of Experiment Stations—organization and publications. U. S. Dept. Agr., Off. Expt. Sta., Cir. No. 102. 22 p.
- VANDEVELDE, A. J. J. Répertoire des travaux publiés sur la composition, l'analyse et les falsifications des denrées alimentaires. Repert. Geschr. Voedingsmiddel., 1900, 140 p.; 1901,

- 165 p. Bull. serv. surveill. fabric. et com. dendrées aliment., 1903; 275-355; 691 references. 1904: 537-629; 725 references. 1905: 371-461; 738 references. 1906: 115 p.; 904 references. 1907: 127 p.; 1040 references. Repert. intern. comp. anal. falsif. dendrées aliment. 8: 94 p. (1909); 1009 references. 9: 80 p. (1910); 887 references. 10: 104 p. (1911); 1174 references. 11: 127 p. (1912); 1551 references; 12: 98 p. (1913). 13: ? p. (1914); 1102 references. Annotated with author index.
- VEREINBARUNGEN** zur einheitlichen Untersuchungen und Beurtheilung von Nahrungs- und Genussmitteln sowie Gebrauchsgegenständen für das Deutsche Reich. Berlin, Springer, 1897-1902. 3 Nos. No. 1 covers "Allgemeine Untersuchungsmethoden," with bibl. footnotes. No. 2 contains bibls. as follows: Flour and bread, p. 49-52; 76 references. Condiments, p. 73-78. Vinegar, p. 83-87. Fruit juices, p. 109; 15 references. Honey, p. 121-122; 32 references. Sweetening agents, p. 137-142. No. 3 contains: Beer, p. 19-23; 103 references. Coffee, p. 37-45; 165 references. Tea, p. 57-61; 84 references. Mate, p. 66-67; 17 references. Cacao, p. 75-81; 123 references. Tobacco, p. 95-99; 79 references; Air, p. 108-114; 116 references.
- VEREIN SCHWEIZERISCHER ANALYTISCHER CHEMIKER.** Manuel suisse des dendrées alimentaires. Méthodes d'analyse . . . Berne, Neukomm, 1919. 436 p. Bibl. footnotes.
- VOIT, FRITZ.** Nahrungsstoffe. *Ergeb. Physiol.* 1: 678-683 (1902). 115 references.
- VULTE, HERMANN T., and VANDERBILT, SADIE B.** Food industries; an elementary textbook on the production and manufacture of staple foods designed for use in high schools and colleges. Easton, Chem. Pub. Co., 1923. 323 p. Bibl., p. 312-319.
- WINTON, A. L.** The microscopy of vegetable foods. New York, Wiley, 1906. 701 p.
- Serial*
- Jahresbericht über die Fortschritte in der Untersuchung der Nahrungs- und Genussmittel. Göttingen. 1891- . . . Classification: General; milk, cheese, butter, eggs, fats and oils, flesh, preservation, bread, fruits and fruit juices, sugar, coffee, tea, cacao, beer, vinegar, wines, water, mineral waters, air.
- Zeitschrift für Untersuchung der Nahrungs- und Genussmittel sowie der gebrauchsggegenstände. Münster. 1898- . . . Classification varies in each number. Covers such fields as fermentation; technical fats, oils and soaps; plant foods; meat; diatetic foods; eggs; sugars; water; sewage; etc.
- See also* DIET. METABOLISM, NUTRITION.
- FOODS: Dehydrated.**
- EKKROTH, CLARENCE V.** Dehydrated, dried and evaporated foods, condensed foods. In Rogers, Manual of industrial chem., p. 1177-1180, 60 references, covering 1876-1918.
- FLEISHER, W. L.** Food dryers. *J. Am. Soc. Heat. Vent. Eng.* 24: 382-384 (1918).
- GREENMAN, E. D.** A selective bibliography on dehydrated foods. *Special Libraries* 10: 108-118 (1919). 370 references.
- JONES, PERRIS.** Dehydrated foods: a list of references to material in the New York Public Library. N. Y. Public Library, Bull. 21: 645-655 (1917). 195 references, annotated.
- FOODS: Preservation.**
- McGILL, A.** Food preservatives. Lab. Internal Rev. Dept., Canada, Bull. No. 126, 1906. 32 p. Bibl. with annotations.
- RÜHLE, H.** Ueber Obst und Obstverwertung. *Z. angew. Chem.* 18: 1852-1856, 1892-1900, 1941-1946 (1905). 67 footnotes.
- SERGER, J.** Die chemischen Konservierungsmittel. *Chem.-Ztg.* 35: 1127-1129, 1150-1152, 1166-1168, 1194-1195, 1202-1203 (1911); 103 footnotes. 38: 209-211, 244-246, 354-356, 370-372 (1914); 92 footnotes.
- FORMALDEHYDE**
- ANDERSON, JOHN F.** The antiseptic and germicidal properties of solutions of formaldehyde and their action upon toxins. U. S. Hyg. Lab., Bull. No. 39, 1907. Bibl., p. 45-48. 39 references.
- MEYER-JACOBSON.** Formaldehyd. In *their Lehrb. org. Chem.* 1, pt. 1: 682-707 (1907). Bibl. footnotes.
- ORLOFF, J. E.** Formaldehyd, der bisherige Stand der wissenschaftlichen Erkenntniss und der technischen Verwendung. Leipzig, Barth, 1909. 327 p. Bibl. footnotes.
- THIELE, ALBRECHT.** Formaldehyd. In *Abderhalden, Biochem. Handl.* 1: 752-763 (1911). About 250 footnotes.

FORMALDEHYDE—Cont'd

VANINO, L., and SEITTER, E. Das Formaldehyd, seine Darstellung. Vienna, 1901.

See also DISINFECTANTS, PLASTICS.

FORMALDEHYDE: Analytical.

HINMAN, J. J., JR. Determination of total formaldehyde in fumigators and commercial solutions. J. Ind. Eng. Chem. 5: 752 (1913). 36 references.

LOCKEMANN, G., and CRONER, F. Ueber die Bestimmung von Formaldehyd und Methylalkohol in wässriger Lösungen. Gehaltsbestimmung von Formalin. Z. anal. Chem. 54: 11-13 (1915). About 75 references.

MACH, F., and HERMANN, R. Vergleichende Prüfung der gebräuchlichsten Methoden für Bestimmung des Formaldehyds in Formalinen. Z. anal. Chem. 62: 135-137 (1923). 51 references.

SMITH, B. H. Comparative study of methods of determining formaldehyde. J. Am. Chem. Soc. 25: 1028-1035 (1903). 28 references.

FORMIC ACID

"Formic acid." Ind.-Cat. S. G. O., 1st ser., 1: 81 (1880); 2nd ser., 1: 111 (1896); 3rd ser., 1: 114-115 (1918). Includes toxicology.

MEYER-JACOBSON. Ameisensäure. In *their* Lehrb. org. Chem. 1, pt. 1: 509-517 (1907). Bibl. footnotes.

SCHMIDT, ERNST. Ameisensäure. In Abderhalden, Biochem. Handl. 1: 912-922 (1911). 215 footnotes. Includes derivatives.

See also ACIDS, ORGANIC.

FREE RADICALS. See RADICALS.**FRUCTOSE**

MEYER-JACOBSON. Fructose. In *their* Lehrb. org. Chem. 1, pt. 2: 977-982 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. *d*-Fructose. In Abderhalden, Biochem. Handl. 2: 359-369 (1911); 8: 179-185 (1914). About 275 footnotes.

ZEMPLÉN, GÉZA. Fructose. In Abderhalden, Biochem. Handl. 10: 520-549 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Fructose. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 5: 942-945 (1922). Bibl. footnotes.

See also CARBOHYDRATES.

FRUITS

BIGELOW, W. D., and DUNBAR, P. B. The acid content of fruits. J. Ind. Eng. Chem. 9: 767 (1917). 33 references.

PARROZZANI, A. [Contribution to the study of the ripening processes of lemons.] Ann. R. Staz. Agrum e Frutticol., 1911. 36 p.

RICE, G. K. Bibliography on the preservation of fruits and vegetables in transit and storage, with annotations. U. S. Dept. Agr., Library Bibl. Contribution, No. 4, 1922. 76 p., mimeographed.

WINDISCH, KARL, and SCHMIDT, PHILIPP. Beiträge zur Kenntniss der Fruchtsäfte. Z. Nahr.-Genussm. 17: 584-603 (1909). Bibl. footnotes.

See also FOODS (Vereinbarungen).

FUCOSE

CLARK, EARL P. The structure of fucose. U. S. Bur. Standards, Sci. Papers No. 459, 1922. Bibl., p. 534.

See also CARBOHYDRATES.

FUELS

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS. Recent publications relative to fuel and its use. J. Am. Soc. Heating Ventilating Eng. 24: 547-580 (1918).

BACON, RAYMOND F., and HAMOR, WM. A. American fuels. New York, McGraw, 1922. 2 vols. Contains bibls.

BARTEL, FRIEDRICH. Torfkraft. Berlin, Springer, 1913. 164 p. Bibl., of 175 references on p. 160-164.

BERTELSMANN, W. Neuerungen in der Industrie flüssiger und gasförmiger Brennstoffe. Chem.-Ztg. 33: 893-894, 902-903 (1909). 54 footnotes.

BERTELSMANN, W. Die gasförmigen Brennstoffe in den Jahren 1912-1919. Chem.-Ztg. 40: 1057, 1070, 1082, 1095 (1916); 546 footnotes. 41: 845-846, 853-854 (1917); 121 footnotes. 44: 197-199, 217-219, 221-223, 237-238 (1920); 342 footnotes.

BERTELSMANN, W. Bericht ueber die Brennstoffe und ihre Verwertung in den Jahre 1907-1908. Chem.-Ztg. 32: 513-514, 530-531; 541-542 (1908); 117 footnotes. 33: 425-426 (1909); 38 footnotes.

BERTELSMANN, W. Die festen Brennstoffe. Chem.-Ztg. 38: 797, 853, 979, 1002 (1914); 289 footnotes. 39: 497-499 (1915); 125 footnotes. 41: 605-608 (1917); 123 footnotes. 43: 641, 673, 690 (1919); 232 footnotes. 44: 365-366, 370-371 (1920); 110 footnotes.

BERTELSMANN, W., and HORMANN, —. Die gasförmigen Brennstoffe. Chem.-Ztg. 34: 894-896 (1910); 56 footnotes. 35: 1245-1246, 1254-1255, 1262-1264 (1911); 181 footnotes. 36: 1489-1490, 1507-1509 (1912); 180 footnotes.

BERTELSMANN, W., and HORMANN, —. Feste Brennstoffe. Chem.-Ztg. 34: 537-538 (1910); 48 footnotes. 35: 1021-1022, 1046-1047 (1911); 124

- footnotes. 36: 1433-1434, 1454-1455 (1912); 123 footnotes.
- ELLIS, CARLETON, and MEIGS, JOSEPH V. Gasoline and other motor fuels. New York, Van Nostrand, 1921. 700 p. Bibl. on liquid fuels.
- FÜRTH, A. Die fossilen Brennstoffe und ihre Verwertung in den Kriegsjahren 1914-1918. *Z. angew. Chem.* 32: 201, 209, 217, 225, 236 (1919); 33: 205, 211, 217, 223 (1920). Bibl. through text.
- GOODRICH, WALTER F. The utilization of low grade and waste fuels. London, Benn, 1924. 368 p. Bibl., p. 358-360.
- GR. BRIT. Patent office. Subject list of works on peat, destructive distillation, artificial lighting, mineral oils and waxes, gas lighting and acetylene in the Library of the Patent Office. 1911. 98 p.
- HARVEY, LEONARD C. Pulverized fuel, colloidal fuel, fuel economy and smokeless combustion. London, MacDonald, 1924. 466 p. Bibl., p. 424-449.
- HASLAM, R. T., and THIELE, E. W. Recent progress in the field of fuels and fuel technology. *Ind. Eng. Chem.* 16: 752-753 (1924). About 250 references.
- HOFMAN, H. O. Fuel. In *his* General Metallurgy, 1913, p. 104-340. Bibl. footnotes.
- LESLIE, EUGENE H. Motor fuels; their production and technology. New York, Chem. Cat. Co., 1923. 681 p. Contains bibls.
- LEWES, VIVIAN B. Liquid and gaseous fuels and the part they play in modern power production. London, Constable, 1907. 334 p. Bibl., p. 323-326.
- MENEGHINI, D. Rivista dei lavori più recenti sui combustibili. *Ann. chim. appl.* 2: 251-275 (1914). 125 footnotes.
- PHILLIPS, WM. B., and WORRELL, S. H. The fuels used in Texas. *Univ. Texas, Bull.* No. 307, 1913. Coal, p. 247-255; petroleum, p. 255-267; natural gas, p. 267-269.
- SOCIETY OF CHEMICAL INDUSTRY. Fuel. In Reports of the progress of applied chemistry 1: 7-30 (1916); 2: 16-51 (1917); 3: 18-40 (1918); 4: 20-40 (1919); 5: 18-41 (1920); 6: 11-37 (1921); 7: 13-42 (1922); 8: 12-32 (1923); 9: 20-50 (1924). Bibl. footnotes.
- U. S. Bureau of Mines. Fuel efficiency publications of the Bureau of Mines. 1913. 8 p.
- U. S. Library of Congress. Select list of references on fuel combustion. 1913. 5 p., typewritten.
- Serial*
Brennstoff-Chemie, 1920-. Each number contains "Brennstoffchemische Umschau," "Zeitschriftenschau," "Patentberichte," and "Bücherbesprechungen."
- Feuerungstechnik. Zeitschrift für den Bau und Betrieb Feuerungstechnischer Anlagen. 1913-. Lists articles relating to fuels and combustion. See also COAL, COKE, GASOLINE, PETROLEUM, PEAT, ETC.
- FUEL OIL**
- ALLEN, IRVING C. Heavy oil as fuel for internal combustion engines. U. S. Bur. Mines, Tech. Paper No. 37, 1913. 36 p. Bibl., p. 26-36. 288 references.
- DEMAREST, ROSE. Oil as a fuel for metallurgical furnaces. Blast furnace Steel Plant 7: 386-389 (1919). Fuel oil bibliography. *Power* 51: 482-484 (1921). 150 references.
- MITCHELL, HERBERT V. Fuel oils and their applications; an introductory treatise on the sources, classification and production of fuel oils, the principles and apparatus involved in their selection, examination and use, with notes on colloidal fuels. London, Pitman, 1924. 171 p. Bibl., p. 165-168.
- MOTOR UNION OF GREAT BRITAIN AND IRELAND—Fuels Committee. Report of the fuels committee of the motor union of Great Britain and Ireland together with the evidences of witnesses and memoranda on petroleum, petroleum spirits, paraffin, shale spirit, benzene, alcohol, etc., and a bibliography. London, 1907. Bibl. on fuels for internal combustion engine, p. 66-71.
- PHILLIPS, WM. B. Fuel oil in the Southwest, with a bibliography of fuel oil generally. *Trans. Am. Inst. Mining Eng.* 48: 582-612 (1914). *Bull.* No. 90: 1040-1070. "Based on Redwood's Treatise on petroleum, with many additions." About 1000 references, classified by uses.
- WILSON, E. M. Petroleo crudo como combustible. *Bol. de Petroleo* 4: 104-181 (1917).
- See also PETROLEUM.
- FULGIDES**
- STOBEE, HANS. Die Farbe der Fulgide und anderer ungesättigte Verbindungen. *Ann.* 349: 333-371 (1906). 87 footnotes.
- FULLER'S EARTH**
- GR. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Fuller's earth. (1913-1919.) 1920. 15 p. Bibl., p. 13.

FULLER'S EARTH—Cont'd

MIDDLETON, JEFFERSON. Fuller's earth. U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 114-115; 1914, pt. 2: 39-40. About 35 references.

PARSONS, CHARLES L. Fuller's earth. U. S. Bur. Mines, Bull. No. 71, 1913. 38 p. Bibl. footnotes.

FULMINIC ACID

MEYER-JACOBSON. Knallsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1295-1303 (1913). Bibl. footnotes.

WIELAND, HEINRICH. Die Knallsäure. Sammlung chem. chem.-tech. Vorträge 14: 457-461 (1909). Chronological bibl., 1880-1909.

See also EXPLOSIVES.

FULVENES

COURTOT, C. H. Étude dans la serie des fulvénes. Ann. chim. (9) 4: 58-156, 168-224 (1915); 5: 52-108, 194-224 (1916). Bibl. footnotes.

FUMARIC ACID

MEYER-JACOBSON. Fumarsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 410-421 (1913). Bibl. footnotes.

THIELE, A. Fumarsäure. *In* Abderhalden, Biochem. Handl. 1: 1144-1147 (1911). 75 footnotes.

FUNGI

ARMSTRONG, GEORGE M. Physiology of the fungi. Sulfur nutrition. The use of thiosulfate as influenced by H ion concentration. Ann. Mo. Botanical Garden 8: 278-281 (1921). 60 references.

BRENNER, WIDAR. Die Stickstoffnahrung der Schimmelpilze. Centr. Bakt., 2 Abt., 40: 644-647 (1914).

FORD, WM. W. Distribution of hemolysins, agglutinins and poisons in fungi, especially the Amanitas, the Entolomas, the Lactarius and the Inocybes. J. Pharmacol. 2: 285-318 (1911). 69 references.

"Fungi, toxicology of." Ind.-Cat. S. G. O., 1st ser., 5: 226-228 (1884); 2nd ser., 5: 1122-1123 (1900).

FUNGICIDES

BAIN, S. M. The action of copper on leaves. Tenn. Agr. Expt. Sta., Bull. 15: 101-106 (1902).

COOK, F. C. Pickering (lime water-copper sulfate) sprays. U. S. Dept. Agr., Bull. No. 866, 1920. Bibl., p. 46-47. 25 references.

D'IPPOLITO, G. [Action of some fungicides on the germination of certain varieties of wheat and oats.] Staz. sper. agr. ital. 43: 735-757 (1910).

See also ANTISEPTICS, BORDEAUX MIXTURE, DISINFECTANTS, GERMICIDES, INSECTICIDES.

FUR

AUSTIN, WM. E. Principles and practice of fur dressing and fur dyeing. New York, Van Nostrand, 1922. 197 p. Bibl., p. 185-186.

FURANE

MEYER-JACOBSON. Furan (Furfuran). *In their* Lehrb. org. Chem. 2, pt. 3: 49-56 (1915). Bibl. footnotes.

FURANE CARBOXYLIC ACIDS

MEYER-JACOBSON. Carbonsäuren der Furan-Reihe. *In their* Lehrb. org. Chem. 2, pt. 3: 66-76 (1915). Bibl. footnotes.

FURFURAL

MEYER-JACOBSON. Furfural. *In their* Lehrb. org. Chem. 2, pt. 3: 56-64 (1915). Bibl. footnotes.

MINER, CARL S., TRICKEY, J. P., and BROWNLEE, H. J. Commercial furfural—its properties and uses. Chem. Met. Eng. 27: 363-366 (1922). 267 references. Chronological.

PERVIER, NORVILLE C., and GORTNER, R. A. The determination of furfural. Ind. Eng. Chem. 15: 1260-1262 (1923). Thesis, Univ. Minn., 1922. 28 p. Bibl., p. 24-28.

WITTE, E. Furfural. *In* Abderhalden, Biochem. Handl. 1: 852-858 (1911). 150 footnotes.

FURFURAL RESINS. *See* PLASTICS.

FURODIAZOLE COMPOUNDS

MEYER-JACOBSON. Furodiazole Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 623-649 (1916). Bibl. footnotes.

FUSEL OIL

BIGELOW, W. D. Index to the literature on the detection and estimation of fusel oil in spirits. J. Am. Chem. Soc. 17: 397-402 (1896). 68 references.

FOERSTER, RUDOLF. Ueber die Wirkung der Fuselöle im menschlichen und tierischen Organismus. Biochem. Centr. 9: 789-799 (1910). 66 footnotes.

See also AMYL ALCOHOL.

GADOLINIUM. *See* RARE EARTHS.

GALACTOSE

HARDING, T. SWANN. History of galactose, its discovery and methods of preparation. Sugar 25: 177 (1923). 34 references.

LIPPMANN, E. O. v. *d*-Galactose. *In his* Chemie der Zuckerarten 1: 686-766 (1895). References through text.

MEYER-JACOBSON. Galaktose. *In their* Lehrb. org. Chem. 1, pt. 2: 974-976 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. *d*-Galaktose. *In* Abderhalden, Biochem. Handl. 2: 349-357 (1911); 8: 176 (1914). 200 references.

ZEMPLÉN, GÉZA. Galaktose. *In* Abderhalden, *Biochem. Handl.* 10: 521-529 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Galaktose. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 940-942 (1922). Bibl. footnotes.

See also CARBOHYDRATES; SUGARS.

GALL STONES

"Calculus, urinary, chemistry of." *Ind.-Cat. S. G. O.*, 1st ser., 2: 635-636 (1881); 2nd ser., 3: 77-78 (1898); 3rd ser., 3: 751 (1922). About 175 references.

LICHTWITZ, L. Ueber die Bildung der Harn- und Gallensteine. *Ergeb. innere Medizin* 13: 1-8 (1914). 227 references.

See also BILE, CHOLESTEROL.

GALLIC ACID

MEYER-JACOBSON, Gallussäure. *In their* *Lehrb. org. Chem.* 2, pt. 1: 646-651 (1902). Bibl. footnotes.

NIEKENSTEIN, M. Gallussäure. *In* Abderhalden, *Biochem. Handl.* 7: 14-19 (1922). 100 footnotes.

GALLIUM

BROWNING, PHILIP E. Index to the literature of gallium. 1874-1903. *Smithsonian Misc. Coll.*, No. 1543, 1904. 11 p. About 75 references.

CHABRE, C. Gallium. *In* Moissan, *Chim. min.* 4: 126-133 (1906). 29 footnotes.

GROSSMANN, H. Gallium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 4, pt. 1: 207-216, 964-966 (1911). References through text.

LITTLE, H. F. V. Gallium. *In* Friend, *Textbook*, 4: 143-149 (1917). Bibl. footnotes.

MELLOR, J. W. Gallium. *In his* *Inorg. theor. chem.* 5: 373-386 (1924). Bibl. through chapter.

RUDORF, G. Gallium. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 1: 376-377 (1906). 59 references, 1875-1905.

GALLOCYANIN

MEYER-JACOBSON. Gallocyanin. *In their* *Lehrb. org. Chem.* 2, pt. 3: 1477-1479 (1920). Bibl. footnotes.

GARBAGE

CHOHURST, HARRY R. Municipal wastes, their character, collection and disposal. U. S. Public Health Ser., Bull. No. 107, 1920. 98 p. Bibl., p. 88-98.

HOLMES, W. C. Refuse and garbage disposal; references to books and magazine articles. Carnegie Library of Pittsburgh, Bull., Jan., 1909. 39 p.

NEW YORK, Public Library. List of works relating to city wastes and street hygiene. N. Y. Public Library, Bull., Oct., 1912. 55 p.

THIESING, —. [Resumé of literature concerning removal and treatment of domestic wastes during and since the war.] *Zentr. ges. Hyg.*, Oct. 12, 25, 1922. 200 references.

See also SEWAGE, WASTE.

GARNET

BRAUNS, H. Die chemische Zusammensetzung granatführender kristallinischer Schiefer, Cordieritgesteine und Sanidinite aus dem Lascher Seegebiet. *Neues Jahrb. Mineral. Geol.* 34: 85-175 (1912). Bibl. footnotes.

DOELTER, C. Granatgruppe. *In his* *Handb. Mineralchem.* 2, pt. 2: 878-1076 (1917). Bibl. footnotes.

See also ABRASIVES, MAGNESIUM ALUMINIUM SILICATE.

GAS: Analysis.

ALEXANDER, HANS. Fortschritte auf dem Gebiete der Gasometrie bezw. Gasmessung und Gasanalyse. *Chem.-Ztg.* 24: 515-519 (1900); 93 footnotes. 25: 999-1002 (1901); 85 footnotes. 26: 781-786 (1902); 111 footnotes. 27: 547-553 (1903); 130 footnotes. 28: 492-498 (1904); 128 footnotes. 29: 817-820 (1905); 58 footnotes. 30: 657-659 (1906); 41 footnotes. 32: 801-802, 817-819 (1908); 55 footnotes. 34: 929-931, 938-940, 947-948 (1910); 97 footnotes.

HAUSER, ENRIQUE. L'analyse des gaz combustibles. *Bull. soc. chim.* 33: 1141-1232 (1923). Bibl. footnotes.

MOREHEAD, J. M. Determination of caloric power value and of operating conditions from analysis of industrial gases. *Am. Gas Light J.* 93: 1129; *Proc. Am. Gas. Inst.* 5: 332 (1910).

SANDER, A. Gasanalyse. *Fortschritte Chem.* 5: 271-279 (1912); 8: 57-68 (1913); 10: 51-67 (1914-15); 11: 219-227 (1915-16). Bibl. through text.

U. S. Bur. Standards. Standard methods of gas testing. 2nd ed. Circular No. 48, 1916. 202 p. Bibl., p. 187-188.

See also AIR ANALYSIS.

GAS: Conservation.

U. S. Library of Congress. List of references on the waste of natural and artificial gas. 1921. Mimeographed. 60 references.

See also GAS, NATURAL.

GAS: Manufacture.

AMERICAN GAS INSTITUTE. Current gas literature. *Proc. Am. Gas Inst.* 1: 1005-1021 (1907); 2: 956-976 (1908).

GAS: Manufacture—Cont'd

BERTELSMANN, W. Lehrbuch der Leuchtgasindustrie. 1911. 2 vols.

BRACKENBURY, C. E. British gas engineering literature. In *British progress in gas works' plant and machinery*, 1905, p. 67-78. About 300 references.

CHESTER, WM. R. Bibliography of coal gas: a subject index to interesting matters published in connection with coal gas to end of year 1891. Nottingham, Bell, 1892. 232 p.

CRAE TREE, FREDERICK, and POWELL, A. R. Sulfur in producer gas. *Bull. Am. Inst. Mining Met. Eng.* No. 153: 2687-2692 (1919).

CRIPPS, F. S. Gas literature, English and foreign. *Trans. Inst. Gas. Engr.* 4: 211-294 (1895).

EVANS, O. B. History of the development of water gas. *Trans. Intern. Gas. Congr.*, 1915. 36 p. Bibl.

FERNALD, R. H., and SMITH, C. D. Resumé of producer-gas investigations, Oct. 1, 1904-June 30, 1910. *U. S. Bur. Mines, Bull. No. 13*, 1911. 393 p. Bibl., p. 359-378. 514 references.

FÜRTH, ARTHUR. Leuchtgas, Kokerei, Generatorgas. *Z. angew. Chem.* 25: 1317-1325, 1362-1371, 1415-1422 (1912); 258 footnotes. 26: 343-351, 355-368 (1913); 423 footnotes. 27: 385-407 (1914); 538 footnotes.

"Illuminating gas and gas works." *Ind.-Cat. S. G. O.*, 1st ser., 5: 291-293 (1884); 2nd ser., 6: 69-73 (1901).

PALMER, C. S. Producer gas, its manufacture and use. *J. Eng. Soc. West Pa.* 34: 347-353 (1918). 70 general references.

PORTER, R. G. Report on the complete gasification of coal. *Tech. Sect., Am. Gas Assoc.*, 4: 129-131 (1922). 60 references and patents.

RITTMAN, W. F., and WHITAKER, M. C. A bibliography of the chemistry of gas manufacture. *U. S. Bur. Mines, Tech. Paper No. 120*, 1915. 29 p. 274 references, classified, with author and subject index. Also in *Gas Age* 36: 412-413, 460-462, 512-514 (1915).

SOCIETY OF CHEMICAL INDUSTRY. Gas, tar and destructive distillation. In *Reports of the progress of applied chemistry*, 1: 31-60 (1916); 2: 52-68 (1917); 3: 41-62 (1918); 4: 41-65 (1919); 5: 42-70 (1920); 6: 38-66 (1921); 7: 43-71 (1922); 8: 33-69 (1923); 9: 51-73 (1924). Bibl. footnotes.

STEUDE, M. Die Literatur des Gas- und Wasserfaches. München, 1896. 77 p. Classified by subjects.

VOLKMAN, KARL TH. Chemische Technologie des Leuchtgases. Leipzig, Spamer, 1915. 220 p. Bibl. footnotes.

WARNER, A. W. Complete gasification of coal. *Proc. Am. Gas Assoc.* 3: 74 (1921). 27 references.

WEYMAN, GEOFFREY. Modern gas-works chemistry. London, Benn, 1922. 184 p. Bibl. at end of chapters.

WILLIAMS, L. J., JR. Progress to date on steaming retorts. *Tech. Section, Am. Gas Assoc.*, 1: 144-147 (1919). 36 references.

WYER, SAMUEL S. Treatise on producer gas and gas producers. New York, McGraw, 1907. 308 p. Bibl., p. 277-290. 355 references, 1841-1905, with annotations. *See also Trans. Am. Inst. Mining. Eng.* 36: 64-78 (1906); *Rev. de Métal.* 3: 396-401, where 200 references, with annotations, are given.

GAS: Manufacture—Byproducts.

BAU, O. Die Fortschritte der Gewinnung der Nebenprodukte bei Kokereibetriebe. *Stahl. u. Eisen*, 30: 1235-1247, 1282-1297 (1910). 117 references.

BEROLZHEIMER, D. D. Bibliography of foreign articles on byproduct recovery in the gas industry. *Proc. Am. Gas Inst.* 1917. 27 p.

Bibliography of products of gas manufacture; conditions prevailing in the by-product market as shown by a compilation of references to the more important articles published in *Gas Age* and other periodicals since 1910. *Gas Age* 35: 321-324, 384-387, 446-447 (1915). About 350 references; chronological.

GAS: Natural.

CZAKO, EMERICH. Beiträge zur Kenntnis natürlicher Gasausströmungen; ueber gasanalytische Untersuchungen, Heliumgehalt und Radioaktivität kohlenwasserstoffhaltiger Gase. Karlsruhe, Braunsche Verlag, 1913. 85 p. Bibl., p. 80-85.

JILLSON, WILLARD R. The conservation of natural gas in Kentucky. Louisville, Morton, 1922. 152 p. Bibl., p. 145-146.

STOPNEVIC, A. D. Gaz naturel, Erdgas, Naturgas, Naturelgas. (Essai de bibliographie). *Ann. geol. min. Russ.* 13: 197-205 (1911). 255 references, 1837-1911.

See also GASOLINE, PETROLEUM.

GAS: Purification.

JACOBSON, D. L. Resumé of literature on liquid purification. *Proc. Am. Gas. Assoc.* 3: 353-363 (1921). 40 references.

- KOWALKE, O. R. Bibliography of articles on naphthalene removal. *Gas Age* 49: 570-571 (1922). About 100 references, 1905-1922.
- POWELL, A. R., and WALKER, K. C. Selected and annotated bibliography on gas purification. *Proc. Am. Gas Assoc.* 3: 242-267 (1921).
- WHITE, ALFRED H., and BALL, S. Bibliography on naphthalene removal from gas prior to 1904. *Am. Gas Light J.* 81: 605 (1904); *J. Gas Light* 88: 326 (1904).
- GASEOUS EXPLOSIONS**
- JONES, G. W., YANT, W. P., and BERGER, L. B. Bibliography on flammable and explosive limits of common combustible gases and vapors. *Ind. Eng. Chem.* 16: 355 (1924). 46 references.
- KRATZ, ALONZO P., and ROSECRANS, C. Z. A study of explosions of gaseous mixtures. *Univ. Ill., Eng. Expt. Sta., Bull.* 19, No. 50: 75-96 (1922). 217 references, 1810-1921.
- WHITE, ALBERT G. Limits for the propagation of flame in inflammable gas-air mixtures. I. Mixtures of air and one gas at the ordinary temperature and pressure. *J. Chem. Soc.* 125: 2387-88 (1924). 30 references.
- GASES: Absorption (Solubility).**
- COSTE, J. H. Absorption of atmospheric gases by water. *J. Soc. Chem. Ind.* 36: 853 (1917); 37: 171T (1918). 89 references.
- KING, GEORGE. The solubility, rate of absorption and of evolution of gases, as influenced by colloids, with special reference to physiology and brewing. *In* Third report on colloid chemistry, 1920, p. 47-48. 66 references.
- MOHR, WERNER. Die Absorption von Radiumemanation durch Kokosnusshohle. *Ann. Physik* 51: 549-576 (1916). Bibl. footnotes.
- MÜHLFARTH, P. Ueber Adsorption von Gasen an Glaspulver. *Ann. Physik* 3: 328-329 (1900). 75 references on adsorption of gases on surfaces of solid compounds.
- See also* ADSORPTION.
- GASES: Diffusion of.**
- MELLOR, J. W. The diffusion of gases. *In his* *Inorg. theor. chem.* 1: 338-343 (1922). 40 references.
- SIEVERTS, ADOLF. Zur Kenntniss der Okklusion und Diffusion von Gasen durch Metalle. *Z. physik. Chem.* 60: 129-201 (1907). Bibl. footnotes.
- GASES: Liquefaction.**
- CAUBET, F. Die Verflüssigung von Gasgemische. *Z. physik. Chem.* 40: 265-268 (1902). 58 references.
- KOLBE, LUDWIG. Flüssige Luft, Sauerstoff, Stickstoff, Wasserstoff. Leipzig, Barth, 1920. 430 p. Patents, p. 382-391. Bibl., p. 392-423.
- MELLOR, J. W. The liquefaction of gases. *In his* *Inorg. theor. chem.* 1: 868-873 (1922). 75 references.
- OLSZEWSKI, K. The liquefaction of gases. *Ion* 1: 243-245 (1908). 58 references.
- See also* REFRIGERATION.
- GASES: Measurement.**
- LITINSKY, L. Messung grosser Gas-mengen. Leipzig, Spamer, 1922. 274 p. Bibl., p. 260-266. 150 references.
- GASES: Physical properties.**
- MATHIAS, E., and CROMMELIN, C. A. Report on the work done in the Leiden cryogenic laboratory concerning the equation of state of argon, neon and hydrogen between the 3rd and 4th International Congress of Refrigeration. *In* Reports and Communications presented by the President, Fourth International Congress of Refrigeration, London, June, 1924, p. 115-118. 27 references.
- MELLOR, J. W. The physical properties of gases. *In his* *Inorg. theor. chem.* 1: 147-170 (1922). 130 references on Boyle's, Dalton's and Charles' laws.
- MELLOR, J. W. Specific heat of gases. *In his* *Inorg. theor. chem.* 1: 786-795 (1922). 100 references.
- PARTINGTON, J. R., and SHILLING, W. G. The specific heat of gases. London, Benn, 1924. 252 p. Bibl., p. 243-249. 352 footnotes, collected in bibl. at the end.
- PEDERSON, F. M. Influence of molecular constitution upon the internal friction of gases. New York, McIlroy, 1905. 59 p. Bibl., p. 54-59. 170 references.
- TABLES ANNUELLES. *Lois des gaz.* 2: 121-123 (1911); 3: 121-126 (1912); 4: 325 (1913-1916).
- TRAUTZ, M., and GROSSKINSKY, O. Messung der spezifischen Wärme von Gasen. *Ann. Physik* 67: 521-526 (1923). 110 references.
- WARTENBERG, H. von. [Scientific survey of gas equilibria.] *Z. Elektrochem.* 21: 464-469 (1915).
- See also* CRITICAL PHENOMENA, KINETIC THEORY.
- GASES: Poisonous.**
- EWERT, RICHARD. Die Ermittlung der in den Teerdämpfen enthaltenen pflanzenschädlichen Bestandteile und die Unterscheidung ihrer Wirkung von anderen akuten rauchbeschädigungen der Pflanzen. *Landw.*

GASES: Poisonous—Cont'd

Jahrb. 50: 695-832 (1917). Bibl. footnotes.

"Gases, irrespirable, offensive and poisonous." Ind.-Cat. S. G. O., 1st ser., 5: 293-296 (1884); 2nd ser., 6: 74 (1901).

GLAISTER, JOHN, and LOGAN, D. D. Gas poisoning in mining and other industries. Edinburgh, Livingstone, 1915. 550 p. 12 p. of bibl.

See also CHEMICAL WARFARE, INDUSTRIAL POISONS, SMOKES.

GASOLINE

CANTELS, R. C. The absorption of gasoline from natural gas. Can. Chem. Met. 6: 178-179, 200 (1922). 46 references.

DEAN, ERNEST W., and JACOBS, W. A. Production of gasoline by cracking heavier oils. U. S. Bur. Mines, Tech. Paper No. 258, 1922. 56 p. Bibl., p. 51-55. 38 annotated references.

ELLIS, CARLETON, and MEIGS, JOSEPH V. Gasoline and other motor fuels. New York, Van Nostrand, 1921. 700 p. Bibl., p. 651-656. "Gasoline from natural gas."

HAMOR, WM. A., and PADGETT, FRED W. The technical examination of crude petroleum, petroleum products and natural gas. New York, McGraw, 1920. 591 p. "Select bibl. of the extraction of gasoline from natural gas." p. 547-549.

HOWARD, M. S. Manufacture of gasoline and benzene-toluene from petroleum and other hydrocarbons. U. S. Bur. Mines, Bull. No. 114, 1916. Bibl., p. 215-225. 364 references with subject index.

KISSLING, RICHARD. Die Gewinnung niedrigsiedenden Anteile am Erdöl durch Zersetzungsdestillation. Petrol. Ztg. 11: 753-758 (1916).

LESLIE, E. A. The chemical treatment of gasoline. Natural gas gasoline. In his Motor fuels, 1923, p. 422-423, 480-481. 40 and 45 footnotes in addition to bibl.

PADGETT, FRED W. Gasoline cracking processes. Chem. Met. Eng. 23: 911-913 (1920). Patents.

ROBSON, JAMES T., and WITHROW, JAMES R. The flash and burning points of gasoline-kerosene mixtures. Chem. Met. Eng. 21: 252 (1919). 30 references.

SINGER, LEOPOLD. Die Fabrikation der Naturgaskondensate. Petroleum Z. 9: 453-469 (1914). About 150 references.

See also FUELS, PETROLEUM.

GASTRIC JUICE

CARLSON, A. J. Secretion of gastric juice in health and disease. Physiol. Rev. 3: 1-40 (1923).

"Gastric juice." Ind.-Cat. S. G. O., 1st ser., 5: 301-302 (1884); 2nd ser., 6: 78-80 (1901).

See also STOMACH.

GAYLUSSITE

WEGSCHEIDER, RUD. Gaylussit. In Doelter, Handb. Mineralchem. 1: 197-199 (1912). 35 footnotes.

GELATIN

DITMAR, RUDOLF. Bibliographie des Leimes. Kolloid-Z. 1: 80-85 (1906). Covers 1870-1906.

FENN, W. O. Effects of electrolytes upon gelatin. J. Biol. Chem. 33: 279 (1918). 34 references.

FROLICH, FER K. Amphoteric character of gelatin and its bearing on certain electrochemical phenomena. Trans. Am. Electrochem. Soc. 46: 153-169 (1924). 38 footnotes.

"Gelatin." Ind.-Cat. S. G. O., 1st ser., 5: 324 (1884); 2nd ser., 6: 116-117 (1901).

HALEN, S. Die Herstellung von Leim und Gelatin. Kunststoffe 2: 161-163, 208-211, 227-231, 267-269 (1912). Patents.

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Chemie und Industrie des Leimes. Chem.-Ztg. 37: 1378-1379 (1913); 36 footnotes. 41: 557-559 (1917); 52 footnotes. 45: 629-632 (1921); 92 footnotes. Also lists of patents. Chem. Umschau 30: 65-67, 85-87 (1923). References through text.

LÜPPO-CRAMER. Ueber Gerbung und Adsorptionsverbindung der Gelatin. Kolloid-Z. 1: 353-364 (1907). 50 footnotes.

PRICE, T. SLATER. Descriptive bibliography of gelatin. In First report of the adhesives research committee, p. 51-129. London, 1922. Classified with critical comments.

PROCTOR, HENRY, and WILSON, JOHN A. Report on collagen and gelatin. In 5th report on colloid chemistry, 1923, p. 13-31. 60 references, p. 19-21, 30-31.

See also ADHESIVES, GLUE.

GELS

BOGUE, ROBERT H. Structure of elastic gels. J. Am. Chem. Soc. 44: 1343-1356 (1922). 50 footnotes.

BRADFORD, S. C. The theory of gels. Biochem. J. 12: 380-381 (1918). 65 references.

BRADFORD, S. C. The reversible sol-gel transformation. Trans. Faraday Soc.

- 16, Appendix: 44-48 (1921). 13 references.
- WILSON, JOHN A. Inhibition of gels. In Third report on colloid chemistry, 1920, 57-59, 60-61.
- See also COLLOIDS.
- GEMS.** See PRECIOUS STONES.
- GEOCHEMISTRY**
- CLARKE, FRANK W. The data of geochemistry. 4th ed. U. S. Geol. Sur., Bull. No. 695, 1920. 832 p. Bibl. footnotes. Earlier editions issued as Bull. Nos. 330, 491 and 616.
- RÖRDAM, K. Studier over udvalgte emner af den kemiske geologi og den kemiske agrokeologi. K. Danske Videns. Selsk. Skrifter 11: 225-315 (1914). Bibl. footnotes.
- RÖSCH, S. Unsere heutige Kenntniss von der Tiefengliederung der Erde. Naturwissenschaften 12: 876 (1924). 44 references.
- GEOTROPISM**
- PHILLIPS, THOMAS G. Chemical and physical changes during geotropism. Bot. Gaz. 69: 168-178 (1920); Thesis, Univ. of Chicago, 1918. 12 references.
- GERANIOL**
- BARTELT, K. Geraniol. In Abderhalden, Biochem. Handl. 7: 366-370 (1912). 70 footnotes.
- MEYER-JACOBSON, Geraniol. In their Lehrb. org. Chem. 1, pt. 1: 922 (1907). 37 references.
- See also ESSENTIAL OILS.
- GERMANIUM**
- BROWNING, PHILIP E. Index to the literature of germanium, 1886-1903. Smithsonian Misc. Coll. No. 1544, 1904, p. 5-7. 34 references. Arranged chronologically with author and subject index.
- CAVEN, ROBERT M. Germanium. In Friend, Textbook, 5: 314-322 (1917). Bibl. footnotes.
- MONIOTTE, M. Germanium. In Moissan, Chim. min. 2: 560-570 (1905). 29 footnotes.
- FRANDTL, W. Germanium. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 217-232 (1911). References through text.
- PRIBAN, RICHARD. Germanium. In Doelter, Handb. Mineralchem. 3, pt. 1: 110-112 (1918). Bibl. footnotes.
- RUDOLF, J. Germanium. In Abegg, Handb. anorg. Chem. 3, pt. 1: 481 (1909). 25 references.
- GERMICIDES**
- OWEN, W. L. Comparative value of various germicides for use in cane sugar factories. La. State Agr. Expt. Sta., Bull. No. 153, 1915. 54 p.
- See also ANTISEPTICS, DISINFECTANTS, FUNGICIDES, INSECTICIDES.
- GERMINATION**
- ATWOOD, W. M. Physiological study of the germination of *Avena fatua*. Bot. Gaz. 57: 410-414 (1914); Thesis, Univ. Chicago, 1913. 68 references.
- CROCKER, WM., and DAVIS, WILMER E. Delayed germination in seed of *Alisma plantago*. Bot. Gaz. 58: 319-321 (1914). 35 references.
- ECKERSON, SOPHIA. Physiological and chemical study of after ripening. Bot. Gaz. 55: 286-300 (1913); Thesis, Univ. of Chicago, 1911. 53 references.
- GARDNER, WRIGHT A. Effect of light on germination of light sensitive seeds. Bot. Gaz. 71: 249-288 (1921); Thesis, Univ. of Chicago, 1916. 51 references.
- NICKLISCH, EMIL G. Untersuchungen ueber den Einfluss einiger chemischen Agentien auf die Keimfähigkeit der Kartoffelknolle. Dissertation, Erlangen, 1912. 51 p. Bibl., p. 48-50.
- PACK, DEAN A. After ripening and germination of Juniperus seeds. Bot. Gaz. 71: 32-60 (1921). 33 references.
- PACK, DEAN A. Chemistry of after ripening, germination and seedling development of Juniper seeds. Bot. Gaz. 72: 139-150 (1921). 22 references.
- WOLKOFF, M. I. Influence of ammonium sulfate on the germination and growth of barley in sand and soil cultures kept at different moisture contents and at various osmotic concentrations of the soil solution. Soil Science 5: 421-480 (1918). 270 references.
- GINGER.** See OLEORESINS.
- GLASS**
- ADAMS, L. H., and WILLIAMSON, E. D. Annealing of glass. J. Franklin Inst. 190: 597-632, 835-870 (1920). 62 footnotes.
- CLARKE, J. R. The electrical properties of glass. Beama 8: 235-238 (1921). 38 references.
- DRALLE, ROB., and DRALLE, CHR. Ueber Neuerungen in der Glas Industrie. Chem.-Ztg. 24: 464-467 (1900); 32 footnotes. 25: 1058-1060 (1901); 15 footnotes. 26: 628-631 (1902); 33 footnotes. 27: 98-101 (1903); 35 footnotes. 28: 121-123 (1904); 15 footnotes. 29: 615-618 (1905); 10 footnotes.
- ECKERT, FRITZ. Ueber die physikalischen Eigenschaften der Gläser. Jahrb. Radioakt. Elektronik 20: 93-114 (1923). 383 references.
- EDINBURGH. Royal Scottish Museum. Library. List of books, etc., relating

GLASS—Cont'd

to glass, in the library of the Museum. Edinburgh, Neill (H. M. S. Off.), 1893. 40 p.

FENAROLI, PIERO. Progressi nella chimica e nella tecnologia del vetro nel 1913. *Ann. chim. appl.* 1: 446-459 (1914). 71 footnotes.

FLUSIN, G. Bibliographie sur l'industrie du verre de silice. *Chimie & Industrie* 5: 270 (1921). 55 references and 81 patents.

FLUSIN, GEORGES. [Silica glass, its properties, history and manufacture.] *Le Verre*, 1922: 145, 171, 193, 217, 241, 266. Silica, 130 references; glass, 60 references and 80 patents.

FRÉMY, ELPHEGE. *Historie de la manufacture royale des glaces de France au xvii^e et au xviii^e siècle*. Paris, Plon-Nourrit, 1909. 444 p. Bibl., p. ix-xii.

HARRIS, J. E., and SCHUMACHER, E. E. Gases evolved from glasses of known chemical composition. *Ind. Eng. Chem.* 15: 174-177 (1923); *Bell Tech. J.* 2: 122-132 (1923). 39 references.

HEMMING, EMILE. Glass. *In his* Plastics and moulded electrical insulations, 1923, p. 101-105. Patents only.

HERSCHKOWITSCH, M. Chemisch-technisches ueber Quarzglas. *In* Doelter, *Handb. Mineralchem.* 2, pt. 1: 157-165 (1914). Bibl. footnotes.

MEYER, H. H. B. List of references on the glass industry. *In* The glass industry, Bureau of Foreign and Domestic Commerce, Misc. Ser., No. 60, 1917, p. 405-423. 460 references, classified.

QUINCKE, G. Struktur und Eigenschaften des Glases. *Ann. Physik* 46: 1025-1053 (1915). Bibl. footnotes.

ROHR, M. v. Die Entwicklungsjahre der Kunst, optisches Glas zu schmelzen. *Naturwissenschaften* 12: 797 (1924). 24 references.

ROSENHAIN, WALTER. Glass manufacture. 2nd ed. London, Constable, 1919. 258 p. Bibl., p. 244-246.

SCHALLER, R. Glas. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 2: 393-394 (1909). 51 references.

SCHULZ, HANS. Das Glas. München, Kosel, 1923. 180 p.

SCHUMACHER, EARLE E. "Electrical conductivity of glass." *J. Am. Chem. Soc.* 46: 1776 (1924). 27 references.

SILVERMAN, ALEXANDER. Alabaster glass: history and composition. *J. Am. Ceram. Soc.* 1: 255-261 (1918). Includes opal, opaque and opalescent glass.

SILVERMAN, ALEXANDER. Colloids in glass. *J. Am. Ceram. Soc.* 7: 795-802 (1924). 26 footnotes.

SILVERMAN, ALEX., and NECKERMAN, PAUL D. The silvering of glass. *Trans. Am. Ceram. Soc.* 17: 12-16 (1915). 125 references.

SMALL, JUDSON G. The cause of the opalescence of glass. *J. Soc. Chem. Ind.* 34: 402-405 (1915). 16 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Glass. *In* Reports of the progress of applied chemistry, 1: 133-149 (1916); 84 footnotes. 2: 204-241 (1917); 131 footnotes. 3: 184-208 (1918); 70 footnotes. 4: 170-177 (1919); 23 footnotes. 5: 185-202 (1920); 84 footnotes. 6: 198-210 (1921); 80 footnotes. 7: 184-196 (1922); 22 footnotes. 8: 205-217 (1923); 20 footnotes. 9: 214-225 (1924); 13 footnotes.

SOLOMON, M. L. Contributions toward a bibliography of the art of glass. Glass making and technology. Glass painting. *Trans. Ceram. Soc. (England)* 12: 65-77, 285-324 (1912-1913).

TOOL, A. Q., and VALASEK, J. Concerning the annealing and characteristics of glass. U. S. Bur. Standards, Sci. Paper No. 358, 1920. Bibl., p. 570-571, covering 1843-1919.

TURNER, W. E. S. Bibliographical contribution towards the study of the durability of glass. *J. Soc. Glass Tech.* 1: 213-222 (1917). Classified.

WRIGHT, F. E. Synthetic and actual chemical analyses of optical glass of different types. *In* The manufacture of optical glass and of optical systems, p. 62-65. (Ordnance Dept. Doc. No. 2037, 1921.) 117 analyses with references.

ZSCHIMMER, E. Glas. *In* Doelter, *Handb. Mineralchem.* 1: 855-918 (1912). Bibl. footnotes.

Serial

Journal of the Society of Glass Technology. 1917-. Abstracts classified under headings: Glass making materials, glass manufacture and properties, lamp worked and general scientific apparatus, decorated glass, optics and optical instruments, illumination and illuminating ware, fuels, refractories and furnaces, chemical analysis, machinery for the working of glass, glassware accessories, general.

See also CERAMICS, SILICATES.

GLASS SANDS

PETTKE, CHARLES R. Glass sands. *Trans. Am. Ceram. Soc.* 19: 160-194 (1919). 13 footnotes.

PETTKE, CHARLES R. Glass manufacture and the glass sand industry of Pennsylvania. *Pa. Geol. Sur., Rept.* 12. 1919. 278 p. *Bibl.*, p. 264-270. 129 titles.

RICHARDSON, CHARLES H. The glass sands of Kentucky. *Ky. Geol. Sur., ser. 6, 1*: 139-145 (1920). 135 references.

GLAUCONITE

COLLET, L. W., and LEE, G. W. Researches on glauconite. *Proc. Royal Soc. Edinburgh* 26: 238-278 (1905-1906). 43 references.

GLAZES. See CERAMICS, ENAMELS, GLASS.**GLIADIN**

GREAVES, JOSEPH E. Some factors influencing the quantitative determination of gliadin. *Univ. Calif. Pub. Physiol.* 4, No. 6: 69-74 (1911).

See also PROTEINS.

GLOBULIN

"Globulin." *Ind.-Cat. S. G. O.*, 2nd ser., 6: 259 (1901). 15 references.

SAMMUELY, FRANZ. Globulin. *In* Abderhalden, *Biochem. Handl.* 4: 80-102 (1911). *Bibl. footnotes.*

See also FIBRIN, PROTEINS.

GLUCAL

ZEMPLÉN, GÉZA. Glucal. *In* Abderhalden, *Biochem. Handl.* 10: 634-640 (1923). *Bibl. footnotes.*

See also CARBOHYDRATES.

GLUCINIUM. See BERYLLIUM.**GLUCOSAMINE**

MEYER-JACOBSON. Glucosamin. *In their* *Lehrb. org. Chem.* 1, pt. 2: 1086-1090 (1913). *Bibl. footnotes.*

ZEMPLÉN, GÉZA. *d*-Glucosamin (Chitosamin). *In* Abderhalden, *Biochem. Handl.* 2: 536-545 (1911); 8: 281-282 (1914); 10: 731-733 (1923). *Bibl. footnotes.*

GLUCONIC ACID

MEYER-JACOBSON. *d*-Gluconsäure. *In their* *Lehrb. org. Chem.* 1, pt. 2: 610-616 (1913). *Bibl. footnotes.*

NEUBERG, C., and REWALD, B. *d*-Gluconsäure. *In* Abderhalden, *Biochem. Handl.* 2: 477-480 (1911). 50 footnotes.

GLUCOSE

"Glucose." *Ind.-Cat. S. G. O.*, 1st ser., 5: 458 (1884); 2nd ser., 6: 264 (1901); 3rd ser., 4: 464-465 (1922).

HALLOCK, E. J. Bibliography of starch sugar. *In* Report on glucose, prepared by the National Academy of Sciences, 1884, p. 65-102; p. 103-108 lists patents on manufacture of

starch and starch sugar. *Chronological.*

LIPPMANN, E. O. v. *d*-Glykose. *In his* *Chemie des Zuckerarten* 1: 199-633 (1895). *Bibl. through text.*

MEYER-JACOBSON. *d*-Glucose. *In their* *Lehrb. org. Chem.* 1, pt. 2: 965-972 (1913). *Bibl. footnotes.*

NEUBERG, C., and REWALD, B. *d*-, *l*-, and *dl*-Glucose. *In* Abderhalden, *Biochem. Handl.* 2: 311-341 (1911); 8: 119-172 (1914). About 950 footnotes.

WICHELHAUS, H. Der Stärkezucker. Chemisch und technologisch behandelt. Leipzig. Akad. Verlagsgesellschaft, 1913. 222 p.

ZEMPLÉN, GÉZA. Glucose. *In* Abderhalden, *Biochem. Handl.* 10: 397-516 (1923). *Bibl. footnotes.*

ZEMPLÉN, GÉZA. Glykose. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 930-938 (1922). *Bibl. footnotes.* See also CARBOHYDRATES.

GLUCOSIDES

BOURQUELOT, EM. La synthèse des glucosides a l'aide des ferments, reversibilité des actions fermentaires. *Bull. soc. chim.* (4), 13, No. 14: i-xxviii (1913). *Bibl. footnotes.*

EULER, H., and LUNDEBERG, J. Glucoside. *In* Abderhalden, *Biochem. Handl.* 2: 578-722 (1911); 8: 289-366 (1914). *Bibl. footnotes.*

HERISSEY, HENRI. Les glucosides. *Bull. soc. chim.* (4), 33: 349-413 (1923). *Bibl. footnotes.*

ROSENTHALER, L. Die Fortschritte der Glucosidchemie. 1908-1909. *Chem.-Ztg.* 33: 569-570 (1909); 23 footnotes. 34: 329-330 (1910); 32 footnotes.

ZEMPLÉN, GÉZA. Glucoside. *In* Abderhalden, *Biochem. Handl.* 10: 752-912 (1923). *Bibl. footnotes.*

ZEMPLÉN, GÉZA. Darstellung von natürlichen Glykosiden. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 353-465 (1922). *Bibl. footnotes.*

ZEMPLÉN, GÉZA. Die wichtigsten physikalischen, physikalisch-chemischen und chemischen Eigenschaften der Kohlenhydrate und Glycosiden. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 972-1064 (1922). *Bibl. footnotes.*

GLUCURONIC ACID

"Glycuronic acid." *Ind.-Cat. S. G. O.*, 2nd ser., 1: 111 (1896); 2nd ser., 1: 115-116 (1918).

MAYER, PAUL. Neuere Untersuchungen ueber die Glukuronsäure. *Biochem. Centr.* 1: 377-383 (1902). 29 references.

GLUCURONIC ACID—Cont'd

MEYER-JACOBSON. Glukuronsäure. *In their Lehrb. org. Chem.* 1, pt. 2: 1104-1107 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. *d*-Glucuronsäure. *In Abderhalden, Biochem. Handl.* 2: 517-526 (1911); 8: 271-279 (1914). 145 footnotes.

NORD, F. D. *d*-Glucuronsäure und ihre Paarlinge. Nachweis und Darstellung. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 1065-1084 (1922). Bibl. footnotes. Bibl. p. 1082-1084.

GLUE

ALEXANDER, JEROME. Glue and gelatin. New York, Chem. Cat. Co., 1923. 236 p. Bibl. footnotes.

ALLEN, S. W., and TRUAX, T. R. Glues used in airplane parts. Rept., U. S. Nat. Advisory Com. Aeronautics, No. 390: 395-396 (1919).

BOGUE, ROBERT H. Chemistry and technology of gelatin and glue. New York, McGraw, 1922. 644 p. Bibl., p. 313-317. 100 references.

BOGUE, ROBERT H. Contributions to the chemistry and technology of gelatin and glue. *J. Franklin Inst.* 193: 795-825; 194: 75-82 (1922). 100 footnotes.

BOGUE, ROBERT H. Evaluation of gelatin and glue. *J. Ind. Eng. Chem.* 14: 435-441 (1922). 73 references.

BOGUE, ROBERT H. Properties and constitution of glues and gelatins. *Chem. Met. Eng.* 23: 202-203 (1920). 160 references.

BOGUE, ROBERT H. Recent chemical and technological advances in our knowledge of gelatin and glue. *J. Ind. Eng. Chem.* 14: 795-797 (1922). 38 references.

BROWNE, F. L. Water resistant glues. *Chem. Met. Eng.* 21: 136-138 (1919). About 40 references.

FOREST PRODUCTS LABORATORY. List of publications on glue, plywood and coatings. Madison, 1921. 3 p.

MARGIVAL, F. Les colles. Paris, Gauthier, 1913. 139 p.

THIELE, L. A. History and development of the glue industry and grease extraction in America. *Trans. Am. Inst. Chem. Eng.* 13, pt. 2: 243-271 (1920). Patents and literature, classified.

See also ADHESIVES, CASEIN, GELATIN, LEATHER.

GLUTACONIC ACID

FEIST, FRANZ. Zur Stereochemie der Glutaconsäuregruppe. *Ann.* 370: 41-60 (1909). 50 footnotes.

GLUTAMINE

PRINGSHEIM, HANS. Glutamin. *In Abderhalden, Biochem. Handl.* 4: 616-

618 (1911); 9: 121-122 (1915). 55 footnotes.

See also AMINO ACIDS.

GLUTAMINIC ACID

MEYER-JACOBSON. Glutaminsäure. *In their Lehrb. org. Chem.* 1, pt. 2: 783-785 (1913). Bibl. footnotes.

PRINGSHEIM, HANS. Glutaminsäure. *In Abderhalden, Biochem. Handl.* 4: 607-612 (1911); 9: 115-118 (1915). About 175 footnotes.

See also AMINO ACIDS.

GLUTARIC ACID

MEYER-JACOBSON. Glutarsäure. *In their Lehrb. org. Chem.* 1, pt. 2: 380-394 (1913). Bibl. footnotes.

THIELE, ALBRECHT. Glutarsäure. *In Abderhalden, Biochem. Handl.* 1: 1136-1138 (1911). Bibl. footnotes.

GLYCERIC ALDEHYDE

NEUBERG, C., and REWALD, B. *dl*-Glycerinaldehyd. *In Abderhalden, Biochem. Handl.* 2: 268-270 (1911). 18 footnotes.

WITZEMANN, E. J. Isolation of crystalline *dl*-glycerin aldehyde from a syrup obtained by the oxidation of glycerol. *J. Am. Chem. Soc.* 36: 1908-1916, 2223-2234 (1914). About 50 footnotes.

GLYCEROL

"Glycerin." *Ind.-Cat. S. G. O.*, 1st ser., 5: 459-460 (1884); 2nd ser., 6: 266-267 (1901).

KEBLER, L. F., and FULLER, H. C. The purity of glycerol. U. S. Dept. Agr., Bur. Chem., Bull. No. 150, p. 24-35 (1912).

LOFFL, K. Ueber quantitative Bestimmung von Glycerin, Rohglycerin und Glycerinunterlaugen im wissenschaftlichen Laboratorium und in der Technik. *Z. angew. Chem.* 30: 197-200 (1917). 61 footnotes.

MEYER-JACOBSON. Glycerin. *In their Lehrb. org. Chem.* 1, pt. 2: 117-141 (1913). Bibl. footnotes.

PINCUSOHN, LUDWIG. Glycerin. *In Abderhalden, Biochem. Handl.* 1: 497-520 (1911). 265 footnotes.

SCHWEIZER, K. Utilization de la fermentation alcoolique comme source de glycérine. *Chimie & Industrie* 6: 149-159 (1921). 104 footnotes.

See also FATS.

GLYCOCOLL

MEYER-JACOBSON. Glykokoll. *In their Lehrb. org. Chem.* 1, pt. 2: 746-750 (1913). Bibl. footnotes.

SCHIEBLER, HELMUTH. Glykokoll. *In Abderhalden, Biochem. Handl.* 4: 391-409 (1911); 9: 71-76 (1915). About 300 references.

See also AMINO ACIDS.

GLYCOGEN

CREMER, MAX. *Physiologie des Glykogens*. *Ergeb. Physiol.* 1: 803-844 (1902). About 1200 references.

GIERKE, E. *Physiologie und Pathologie der Glykogenablagerung*. *Ergeb. Pathol.* 11, pt. 2: 871-874 (1907). 82 references.

"Glycogen." *Ind.-Cat. S. G. O.*, 1st ser., 5: 460-461 (1884); 2nd ser., 6: 267-269 (1901).

HAFFMANS, HEINRICH. *Ueber den Einfluss der Fütterung verschiedener Zuckerarten auf den Glykogengehalt der Leber*. Dissertation, Berne, 1910. 60 p. *Bibl. footnotes*.

LANGFELDT, EINAR. *Glycogen formation and glycogenolysis*. *J. Biol. Chem.* 46: 381 (1921). 40 references.

"Liver, glycogenolysis in." *Ind.-Cat. S. G. O.*, 1st ser., 8: 262-264 (1887); 2nd ser., 9: 664-666 (1904).

MEYER-JACOBSON. *Glykogen*. *In their Lehrb. org. Chem.* 1, pt. 2: 1035-1038 (1913). *Bibl. footnotes*.

NEUBERG, CARL, and REWALD, BRUNO. *Glykogen*. *In Abderhalden, Biochem. Handl.* 2: 255-264 (1911); 8: 85-95 (1914). 250 footnotes.

PFLUGER, E. *Glykogen*. *Pfluger's Archiv* 96: 1-398 (1903). *Bibl. footnotes*. Revised in *his* *Das Glykogen und seine Beziehungen zu Zuckerkrankheit*, 2nd ed. Bonn, 1905. 528 p. *Bibl. footnotes*.

ZEMPLÉN, GÉZA. *Glykogen*. *In Abderhalden, Biochem. Handl.* 10: 347-356 (1923). *Bibl. footnotes*.

See also LIVER (Weinland).

GLYCOL ALDEHYDE

MEYER-JACOBSON. *Glykolsäure-aldehyd*. *In their Lehrb. org. Chem.*, 1, pt. 2: 887-890 (1913). *Bibl. footnotes*.

NEUBERG, CARL, and REWALD, BRUNO. *Glykolaldehyd*. *In Abderhalden, Biochem. Handl.* 2: 265-267 (1911). 40 footnotes.

GLYCOLLIC ACID

MEYER-JACOBSON. *Glykolsäure*. *In their Lehrb. org. Chem.* 1, pt. 2: 546-550 (1913). *Bibl. footnotes*.

THIELE, A. *Glykolsäure*. *In Abderhalden, Biochem. Handl.* 1: 1053-1057 (1911). 75 footnotes.

GLYCOLS

EVANS, W. L., and WITZEMANN, E. J. *The oxidation of propyleneglycol*. *J. Am. Chem. Soc.* 34: 1086-1104 (1912). *Bibl. footnotes*.

KOOPAL, S. A. *Transposition intramoléculaire dans les α -glycols*. *Rec. trav. chim.* 34: 116-186 (1915). *Bibl. footnotes*.

See also ALCOHOLS.

GLYCOSURIA

CAMMIDGE, P. J. *Glycosuria and allied conditions*. London, 1913. 467 p.

CHRIST, H. *Die Neubildung von Kohlenhydrat im Tierkörper. Die Bildung von Kohlenhydrat aus Fett. Die Physiologie der Ketonkörper*. 3. *Die Beziehungen verschiedener organischer Substanzen zur Glykogen- und Zuckerbildung im tierischen Organismus*. *Ergeb. Physiol.* 22: 51-69, 220-228 (1923).

"Glycosuria." *Ind.-Cat. S. G. O.*, 1st ser., 5: 461-462 (1884); 2nd ser., 6: 270 (1901).

KURIYAMA, S. *Influence of repetition of epinephrine injections upon the intensity of glycosuria and hyperglycemia*. *J. Biol. Chem.* 34: 269 (1918). 44 references.

LUSK, G. *Phlorhizin Glykosuria*. *Ergeb. Physiol.* 12: 315-324 (1912). 212 references.

SALANT, WM., and WISE, L. E. *Production of glycosuria by zinc salts*. *J. Biol. Chem.* 34: 447 (1918). 32 references.

See also DIABETES.

GLYCYL-GLYCINE

RASKE, KARL. *Glycylglycin*. *In Abderhalden, Biochem. Handl.* 4: 211-220 (1911). *Bibl. footnotes*.

See also POLYPEPTIDES.

GLYCYRRHIZIN

LINZ, ARMIN. *Vergleichende Untersuchungen der zur Bestimmung des Glycyrrhizins . . . vorgeschlagenen Methoden*. *Arch. Pharm.* 254: 216-219 (1916).

GLYOXAL

MEYER-JACOBSON. *Glyoxal*. *In their Lehrb. org. Chem.* 1, pt. 2: 813-817 (1913). *Bibl. footnotes*.

GLYOXYLIC ACID

DEBUS, HEINRICH. *Beiträge zur Kenntniss der Glyoxylsäure*. *Ann.* 338: 322-360 (1905). 47 footnotes.

MEYER-JACOBSON. *Glyoxylsäure*. *In their Lehrb. org. Chem.* 1, pt. 2: 1090-1095 (1913). *Bibl. footnotes*.

THIELE, A. *Glyoxylsäure*. *In Abderhalden, Biochem. Handl.* 1: 1082-1084 (1911). 60 footnotes.

GOLD

CUMENGE, E., and FUCHS, EDMOND. *L'or, ses propriétés, ses gisements et son extraction*. *In* Frémy, *Enc. chim.* 3, 16^e cahier: pt. 1: 253-258 (1888).

ÉTARD, OR. *In* Moissan, *Chim. min.* 5: 602-648 (1906). 141 footnotes.

FRARY, FRANCIS C. *The electrodeposition of gold and silver*. *Trans. Am. Electrochem. Soc.* 23: 25-97 (1913). 414 footnotes.

GOLD—Cont'd

- GALECKI, A. Koagulationsstudien an Goldhydrosol. *Kolloid-Z.* 10: 169-178 (1912). 40 footnotes.
- GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. *Gold.* (1913-1919.) 1922. 366 p. *Bibl.*, p. 330-349.
- GUTBIER, A., HUBER, J., and KUHN, E. Ueber kolloides Gold. *Kolloid-Z.* 18: 57-65, 263-273 (1916). 41 footnotes.
- LIVERSIDGE, A. Contributions to the bibliography of gold. *Australian Assoc. Adv. Sci.*, 1895. 22 p.
- LOTTERMOSER, —. Kolloidchemie des Goldes. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 1: 849-850 (1907). 46 references.
- MELLOR, J. W. Gold. *In his* *Inorg. theor. chem.* 3: 491-618 (1923). Occurrence, 50 references; mining, 10 references; cyanide and chlorination process, 75 references; purification, 10 references; physical processes, 250 references; chemical processes, 125 references.
- PENZER, N. M. Gold. *In his* *Nonferrous metals and other minerals*, 1924. *Bibl.*, p. 229-233.
- U. S. GEOLOGICAL SURVEY. Publications of the U. S. Geol. Sur. on gold, silver, copper, lead and zinc in the Central States. U. S. Geol. Sur., *Mineral Resources*, 1914, pt. 1: 123-124. 28 references. Same for Eastern States. *Ibid.* 161-163. 67 references.
- VANINO, L. Gold. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 232-332, 1547-1654 (1914). References through text.
- WALKER, A. J. Gold. *In* Friend, *Textbook* 2: 322-352 (1924). *Bibl.* footnotes.
- WOHLWILL, H. Gold. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 1: 827-833 (1907). 368 references.
- GOLD: Alloys.**
- MELLOR, J. W. Alloys of gold, silver and copper. *In his* *Inorg. theor. chem.* 3: 571-577 (1923). 125 references.
- VANINO, L. [Gold alloys.] *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 317-331 (1914). Discusses alloys with Al, Zn, Cd, Sn, Pb, Fe, Cu, Ag.
- See also* ALLOYS.
- GOLD: Metallurgy.**
- BERNEWITZ, M. W. von. Gold and silver. *Mineral Ind.* 25: 272-368 (1916); 26: 213-301 (1917); 27: 249-331 (1918); 28: 235-313 (1919); 29: 241-325 (1920); 30: 238-326 (1921). *Bibl.* footnotes.
- CLEVENGER, G. H. The electrolytic precipitation of gold, silver and copper from cyanide solutions. *Trans. Am. Electrochem. Soc.* 28: 301-302 (1915). 24 references, "selected."
- CLEVENGER, G. H. Hydrometallurgical treatment of complex gold and silver ores. *Proc. 2nd Pan-Am. Sci. Congr.*, 8: 448-452; *Met. Chem. Eng.* 14: 203-210 (1916). 48 footnotes.
- HALEN, S. Neue Arbeiten auf dem Gebiete der Erforschung und Gewinnung des Goldes sowie seiner Verbindungen. *Edel-Erden u. Erze* 2: 113-115, 121-123 (1921). References through text.
- MEREN, —. Die Gewinnung des Goldes aus Erzen, Kiesen, u. dgl. auf dem Wege der Chlorextraktion. *Edel-Erden u. Erze* 2: 49-51 (1921). Patents through text.
- ROSE, T. KIRKE. *Metallurgy of gold.* 6th ed. London, Griffin, 1915. 601 p. *Bibl.*, p. 564-574.
- See also* CYANIDE PROCESS.
- GOLD BROMIDES**
- MELLOR, J. W. Gold bromides. *In his* *Inorg. theor. chem.* 3: 605-608 (1923). 25 references.
- VANINO, L. Goldbromide. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 280-281 (1914).
- GOLD CHLORIDES**
- MELLOR, J. W. Gold chlorides. *In his* *Inorg. theor. chem.* 3: 586-605 (1923). 175 references.
- VANINO, L. Goldchloride. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 272-280 (1914).
- GOLD HYDROXIDES AND OXIDES**
- MELLOR, J. W. Oxides and hydroxides of gold. *In his* *Inorg. theor. chem.* 3: 577-585 (1923). 50 references.
- VANINO, L. Gold und Sauerstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 260-265 (1914).
- GOLD SULFIDES**
- MELLOR, J. W. The sulphides of gold. *In his* *Inorg. theor. chem.* 3: 610-614 (1923). 40 references.
- VANINO, L. Goldsulfide. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 2: 267-269 (1914).
- GOSSYPOL**
- WITHERS, W. A., and CARRUTH, F. A. Gossypol, the toxic substance in cottonseed meal. *J. Agr. Res.* 5: 261-288 (1915); 12: 83-101 (1918). 42 references.
- See also* COTTONSEED MEAL.

GRANITE

- ANDERSEN, OLAF. Das System Anorthit—Forsterit—Kieselsäure. *Neues Jahrb. Min. Geol.* 40: 701-758 (1915-1916). Bibl. footnotes.
- DALE, T. NELSON. The chief commercial granites of Massachusetts, New Hampshire and Rhode Island. *U. S. Geol. Sur., Bull.* No. 354, 1908. 228 p. Bibl., p. 215-217. 46 references.
- DALE, T. N. The granites of Vermont. *U. S. Geol. Sur., Bull.* No. 404, 1909. 138 p. Bibl., p. 127-129. 59 references.
- DALE, T. N. Commercial granites of New England. *U. S. Geol. Sur., Bull.* No. 738, 1923. 488 p. Bibl., p. 464-467.
- TAYLOR, C. H. Granites of Oklahoma. *Okla. Geol. Sur., Bull.* No. 20, 1915. 108 p. Bibl., p. 106-108. 38 references.
- WATSON, T. L. Granites of the southeastern Atlantic states. *U. S. Geol. Sur., Bull.* No. 426, 1910. 282 p. Bibl., p. 272-274. 56 references.

See also CALCIUM ALUMINIUM SILICATE.

GRAPHITE

- BASTIN, EDSON S. Graphite. *U. S. Geol. Sur., Mineral Resources* 1908, pt. 2: 736-738; 1911, pt. 2: 1102-1103; 1913, pt. 2: 246-251; 1914, pt. 2: 168-174. About 90 different references.
- BEACH, L. M., and BASCOM, F. Graphite in 1919. *U. S. Geol. Sur., Mineral Resources* 1919, pt. 2: 323-324. 14 references.
- CIRKEL, FRITZ. Graphite, its properties, occurrence, refining and uses. Canada, Dept. Mines, Mines Br., 1907. 307 p. Bibl., p. 287-289. 41 references.
- DONATH, EDUARD. Der Graphit. Eine chemisch-technische Monographie. Leipzig, Deuticke, 1904. 175 p. Bibl., p. 174-175.
- GT. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Graphite. 1923. 57 p. Bibl., p. 54-57.
- GUTHRIE, A. Graphit. In *Gmelin-Kraut, Handb. anorg. Chem.*, 1, pt. 3: 472-474, 482-488, 505-510, 529-532 (1911).
- HEINISCH, W., and AMBERG, R. Graphit. In *Doelter, Handb. Mineralchem.* 1: 57-96 (1912). 115 footnotes.
- KOHLSCHÜTTER, V. Ueber den graphitischen Kohlenstoff. *Z. anorg. allgem. Chem.* 105: 35-68, 121-144 (1918-1919). Bibl. footnotes.

MELLOR, J. W. The genesis of graphite. In *his Inorg. theor. chem.* 5: 743-744 (1924).

MILLER, BENJ. L. Graphite deposits of Pennsylvania. *Penn. Topog. Geol. Sur., Rept.* No. 6, 1912. 148 p. Bibl., p. 129-140. 82 references, 1825-1911.

MOISSAN, H. Graphites. In *his Chim. min.* 2: 218-257 (1905). 125 footnotes.

PENZER, N. M. Graphite. In *his Non-ferrous metals and other minerals*, 1924. Bibl., p. 233.

REDFIELD, ARTHUR. Foreign graphite in 1919. *U. S. Geol. Sur., Mineral Resources*, 1919, pt. 2: 209-210. Classified by countries.

SPENCE, H. S. Graphite. Canada, Dept. Mines, Mines Br., Rept. No. 511, 1920. 202 p. Bibl., p. 195-196. 52 references.

GRIGNARD REACTION

SCHMIDT, JULIUS. Die organischen Magnesiumverbindungen und ihre Anwendung zu Synthesen. *Sammlung chem. chem.-tech. Vorträge* 10: 138-146 (1905); 13: 432-446 (1908). Also bibl. footnotes and tables.

WEST, CLARENCE J., and GILMAN, HENRY. Organomagnesium compounds in synthetic chemistry; a bibliography of the Grignard reagent, 1900-1921. National Research Council, Reprint and Circ. Ser., No. 24, 1922. 101 p. 1500 references with index of compounds.

WREN, HENRY. Organometallic compounds of zinc and magnesium. New York, Van Nostrand, 1913. 100 p. Bibl., p. 93-98. 201 references.

GROWTH

ARON, HANS. Biochemie des Wachstums des Menschen und der höheren Tiere. In *Oppenheimer, Handb. Biochem., Ergänzungsband*, 1913, p. 610-674. 246 footnotes.

MENDEL, LAFAYETTE B. Das Wachstum. *Ergeb. Physiol.* 15: 103-106 (1916). 121 references, up to 1914.

ROBERTSON, T. B. Chemical basis of growth and senescence. Philadelphia, Lippincott, 1923. 389 p. Bibl. of 538 references.

ROSSLE, ROBERT. Wachstum und Altern. *Physiologischer Teil. Ergeb. allgem. Path.* 18, pt. 2: 678-696 (1917). 493 references.

WELLS, H. G. The chemistry of growth and repair. In *his Chemical pathology*, 4th ed., p. 276-289 (1920). 65 footnotes.

See also DIET, METABOLISM, NUTRITION, VITAMINES.

GUAIACOL

EINBECK, H. Guajacol. *In* Abderhalden, Biochem. Handl. 1: 611-616 (1911). 100 footnotes.

"Guaiacol and compounds." *Ind.-Cat.*, S. G. O., 2nd ser., 6: 518-520 (1901).

GUANASE. *See* AMIDASE, ENZYMES.

GUANIDINE

MEYER-JACOBSON. Guanidin. *In their* Lehrb. org. Chem. 1, pt. 2: 1407-1419 (1913). Bibl. footnotes.

RONA, PETER. Guanidin. *In* Abderhalden, Biochem. Handl. 4: 783 (1911); 9: 187-192 (1915). 100 footnotes.

ZEMPLÉN, GÉZA. Guanidin. *In* Abderhalden, Biochem. Handl. 11: 243-250 (1924). Bibl. footnotes.

See also PURINES, AMINES.

GUANINE

BRAHM, C., and SCHMID, J. Guanin. *In* Abderhalden, Biochem. Handl. 4: 1027-1034 (1911). Bibl. footnotes.

MEYER-JACOBSON. Guanin. *In their* Lehrb. org. Chem. 2, pt. 3: 1331-1335 (1920). Bibl. footnotes.

See also PURINES, NUCLEIC ACIDS.

GUANYLIC ACID. *See* NUCLEIC ACIDS.

GUMS

GRAFE, VIKTOR. Gummisubstanzen, Hemicellulosen, Pflanzenschleime, Pektinstoffe, Huminsubstanzen. *In* Abderhalden, Biochem. Handl. 2: 1-113 (1912); 8: 1-22 (1914). Bibl. footnotes.

See also RESINS, CARBOHYDRATES (Soc. Chem. Ind.).

GUN POWDER

MELLOR, J. W. Gun powder. *In his* Inorg. theor. chem. 2: 829 (1922). 30 references.

See also EXPLOSIVES.

GUTTA PERCHA. *See* RUBBER.

GYPNUM

BURCHARD, E. F. Gypsum. U. S. Geol. Sur., Mineral Resources, 1910, pt. 2: 731-733. 50 references.

COLE, L. H. Gypsum in Canada: its occurrence, exploitation, and technology. Canada, Dept. Mines, Mines Br., No. 245, 1913. 256 p. Bibl., p. 165-179. 94 references.

GRENGC, R. Die Entwässerungsprodukte des Gipses. Z. anorg. Chem. 90: 327-360 (1915). Bibl. footnotes.

GRIMSLEY, G. P. The gypsum of Michigan and the plaster industry. Mich. Geol. Sur., 9, pt. 2, 1904. 246 p. Bibl., p. 234-241. 147 references.

GRIMSLEY, G. P., and BAILEY, E. H. S. Special report on gypsum and gypsum cement plasters. Kansas Geol. Sur., 5, 1899. 183 p. Bibl., p. 174-178. 107 references.

GR. BRIT. Imperial Mineral Resources Bureau. Mineral industry of the British Empire and foreign countries. War period. Gypsum. 1923. 31 p. Bibl., p. 27-31.

MELLOR, J. W. The dehydration and rehydration of gypsum. *In his* Inorg. theor. chem. 3: 777 (1923). 50 references.

STONE, R. W., *et al.* Gypsum deposits of the United States. U. S. Geol. Sur., Bull. No. 697, 1920. 326 p. Bibl., p. 309-316. 175 references, classified by locality. Includes technology.

WILDER, FRANK A. Gypsum. Mineral Ind. 26: 319 (1917); 27: 343-350 (1918); 28: 329-336 (1919); 29: 340-348 (1920); 30: 334-342 (1921). About 70 references.

WILDER, FRANK A. Gypsum: its occurrence, origin, technology and uses. With special chapters devoted to gypsum in Iowa. Iowa, Geol. Sur., Repts. and papers, 28. Annual repts., 1917-1918, p. 47-537. Bibl., p. 473-536.

See also FERTILIZERS.

HABER PROCESS. *See* NITROGEN FIXATION.

HAFNIUM

URBAIN, G. Should the element of atomic number 72 be called celtium or hafnium. Chem. Ind. 42: 764-769, 929-930 (1923).

HAIR

SCHALL, MAX. Die Herstellung künstlicher Haare. Kunststoffe 4: 361-363, 374-376 (1914). Patents through text.

SCHALL, MAX. Die Herstellung künstlicher Borsten. Kunststoffe 4: 337-339 (1914). Patents through text.

HALIDES, DOUBLE

MELLOR, J. W. Double halides. *In his* Inorg. theor. chem. 2: 233 (1922). 30 references.

PFEIFFER, P. Die Halogenosalze. Z. anorg. Chem. 31: 191-229 (1902). 175 double salts of iodine and 202 of bromine listed with literature references.

See also COMPLEX COMPOUNDS.

HALOGENS. *See* BROMINE, CHLORINE, FLUORINE AND IODINE.

HALOUS ACIDS

MELLOR, J. W. Chlorine, bromine and iodine trioxides and the corresponding acids. *In his* Inorg. theor. chem. 2: 286 (1922). 40 references.

HARDNESS

AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Bibliography of hardness testing. Trans. Am. Soc. Steel

Treating 4: 507-535 (1923). Annotated. Covers 1913-1923.

See also MATERIALS, TESTING.

HEAT OF COMBUSTION

DICKINSON, H. C. Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid and naphthalene. U. S. Bur. Standards, Sci. Paper No. 230, 1914. Bibl., p. 256-7. 41 references.

LANDOLT-BÖRNSTEIN. Verbrennungswärme organischer Verbindungen. In *their* Tabellen, 4th ed., 1912, p. 945-946; 5th ed., 1923, p. 1625-1627.

HEAT OF DILUTION

LANDOLT-BÖRNSTEIN. Verdünnungswärmen. In *their* Tabellen, 4th ed., 1912, 888-891; 5th ed., 1923, p. 1562-1565.

HEAT OF FORMATION

LANDOLT-BÖRNSTEIN. Bildungswärme. In *their* Tabellen, 4th ed., p. 850-857, 882-884; 5th ed., 1923, 1489-1546.

HEAT OF FUSION

LANDOLT-BÖRNSTEIN. Schmelz- und Verdampfungswärme. In *their* Tabellen, 4th ed., p. 844-845; 5th ed., p. 1470-1471, 1474-1475, 1484-1485.

HEAT OF HYDRATION

JORISSEN, W. P. De hydratatiewarmte. Chem. Weekblad 5: 875-888 (1908). Bibl. footnotes.

HEAT INSULATION

HERTER, CHARLES H. Bibliography on heat transmission. J. Am. Soc. Refrig. Eng. 6: 379-403 (1920).

HEAVY CHEMICALS. See ACIDS, ALKALIES AND SALTS; names of chemicals.

HEDONAL. See SEDATIVES.

HELIUM

BRISCOE, H. VINCENT. Helium. In Friend, Textbook, 1, pt. 2: 298-321 (1914). Bibl. footnotes.

PRANDTL, W. Helium. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 150-158 (1907).

SABATIER, PAUL. Hélium. In Moissan, Chim. min. 1: 62-65 (1904). 56 footnotes.

WEAVER, E. R. Bibliography of helium literature. 2nd ed. U. S. Bur. Standards, Circ. No. 81, 1922. 32 p. 1st ed., 1919, also appeared in J. Ind. Eng. Chem. 11: 682-688 (1919). Classified.

See also GAS, NATURAL (Czako).

HEMAGGLUTINATION

RAUBITSCHKE, H. Die Hämagglutination. Z. Immunität II, 2: 195-200 (1910). 239 references.

HEMATIN

"Hematin and hemin." Ind.-Cat., S. G. O., 1st ser., 5: 707 (1884); 2nd ser., 6: 624-625 (1901).

REINHOLD, B. v. Hämatin. In Abderhalden, Biochem. Handl. 6: 228-232 (1911); 9: 340-341 (1914). About 85 references.

SCHUMM, O. Bildung, Vorkommen und Merkmale des Hämatins; Nachweis und Bestimmung von Hämatin im Blutserum. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 365-382 (1921). Bibl. footnotes. See also HEMOGLOBIN.

HEMATINIC ACID

KÜSTER, WM. Ueber die Constitution der Hämatinsäure. Ann. 315: 174-218 (1900); 345: 1-59 (1906). 150 footnotes.

HEMATITE. See IRON ORES.

HEMATOPORPHYRIN

GÜNTHER, HANS. Die Bedeutung der Hämatoporphyrine in Physiologie und Pathologie. Ergeb. allgem. Path. 20, pt. 1: 608-764 (1922). 409 references, 131 being purely chemical.

REINHOLD, B. v. Hämatoporphyrin. In Abderhalden, Biochem. Handl. 6: 242-250 (1911); 9: 351-358 (1914). About 120 footnotes.

HEMATOXYLIN

RUPE, H., and ALTENBURG, H. Hämatoxylin. In Abderhalden, Biochem. Handl. 6: 142-147 (1911). 75 footnotes.

See also PLANT PIGMENTS.

HEMICELLULOSE

GRAFE, VIKTOR. Hemicellulosen. In Abderhalden, Biochem. Handl. 2: 42-60 (1911); 8: 6-15 (1914). About 350 references.

See also CELLULOSE, COTTON.

HEMIN

REINHOLD, B. v. Hämin. In Abderhalden, Biochem. Handl. 6: 234-242 (1911); 9: 342 (1915). About 120 footnotes.

See also HEMATIN.

HEMOGLOBIN

BARCROFT, JOSEPH. The significance of hemoglobin. Physiol. Rev. 4: 350-351 (1924). 51 references.

"Hemoglobin." Ind.-Cat. S. G. O., 1st ser., 5: 718-719 (1884); 2nd ser., 6: 639-642 (1901).

NEILL, JAMES M. Studies on the oxidation-reduction of hemoglobin and methemoglobin. I. The changes induced by pneumococci and by sterile animal tissue. J. Exptl. Med. 41: 311-313 (1925). 93 references.

REINHOLD, B. v. Hämoglobin, Oxyhämoglobin. In Abderhalden, Biochem. Handl. 6: 188-208 (1911); 9: 331-335 (1915). About 300 footnotes.

HEMOGLOBIN—Cont'd

ROBSCHKEIT, FRIEDA S. Comparative study of hemoglobin determination by various methods. *J. Biol. Chem.* 41: 209 (1920). 13 references.

SCHUMM, O. Spektrographische Methoden zur Bestimmung des Häoglobins und verwandter Farbstoffe. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 3: 63-126 (1921). Bibl. footnotes.

WELKER, WM. H., and WILLIAMSON, C. S. Hemoglobin—optical constants. *J. Biol. Chem.* 41: 75 (1920). 19 references.

See also BLOOD PIGMENTS.

HEMOLYSIS

LANDSTEINER, KARL. Hämagglutination und Hämolysen. *In* Oppenheimer, *Handb. Biochem.* 2: 393-541 (1908). 227 and 568 footnotes.

SACHS, HANS. Die Hämolysene und die cytotoxischen Sera. *Ergeb. allgem. Path.* 11, pt. 1: 515-533 (1907). 475 references.

STEWART, G. N. Mechanism of hemolysis with special reference to the relation of electrolytes to cells. *J. Pharmacol.* 1: 49-121 (1909). 178 footnotes.

WELLS, H. G. Hemolysis by known chemical and physical agencies. *In* his *Chemical pathology*, 4th ed., p. 211-228 (1920). 110 footnotes.

HEMOPYRROLE

HAHN, A. [Hemopyrrole and the scission of hemin by oxidation.] *Z. Biol.* 64: 141-160 (1914).

MEYER-JACOBSON. Hämpyrrol. *In* their *Lehrb. org. Chem.* 2, pt. 3, 167-170 (1915). Bibl. footnotes.

HEMOSTATICS

"Hemostatics." *Ind.-Cat. S. G. O.*, 1st ser., 5: 771-772 (1884); 2nd ser., 6: 675-676 (1901).

See also BLOOD, COAGULATION.

HEPTADECYLIC ACID

BÖMER, A., and LIMPRICH, R. Heptadekylsäure und Triheptadekylin. *Z. Nahr.-Genussm.* 23: 641-653 (1912). 40 footnotes.

See also ACIDS, ORGANIC.

HEPTANE

BAUM, FRITZ. Heptane. *In* Abderhalden, *Biochem. Handl.* 1: 100-104 (1911). 50 footnotes. (Includes derivatives.)

See also HYDROCARBONS.

HEROIN

"Heroin." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 75-76 (1902).

See also MORPHINE.

HERRING

SCHMIDT-NIELSEN, SIGVAL. Chemical and microbiological investigations on

the curing of herring. Rept. on Norwegian fishery and marine investigations, 1, No. 8, 1900. 24 p. Bibl. *See also* FISH.

HETEROCYCLIC COMPOUNDS

EINBECK, H. Heterocyclische Verbindungen. *Fortschritte Chem.* 2: 255-271 (1910); 4: 115-134 (1911); 5: 355-370 (1912); 8: 43-56 (1913); 9: 301-319 (1914); 14: 153-178 (1918-1919). References through text.

MEYER-JACOBSON. Heterocyclische Verbindungen. *In* their *Lehrb. org. Chem.* 2, pt. 3, 1915-1920. 1634 p. Bibl. footnotes.

HEULANDITE

DOELTER, C. Heulandit. *In* his *Handb. Mineralchem.* 2, pt. 3: 171-197 (1921). Bibl. footnotes.

HEUSLER ALLOYS

HEUSLER, FR., and TAKE, W. Heusler alloys. *Trans. Faraday Soc.* 8: 169-184 (1913); *Ferrum* 11: 207-209 (1913-1914). 54 footnotes.

See also ALLOYS.

HEXAMETHYLENE. *See* FORMALDEHYDE.

HEXAMETHYLENETETRAMINE

HOWELL, E. V., and KEYSER, E. V. Hexamethylenamine. *J. Am. Pharm. Assoc.* 6: 445-451 (1917). 19 references.

MEYER-JACOBSON. Hexamethylentetramin. *In* their *Lehrb. org. Chem.* 1: 751-753 (1907). Bibl. footnotes.

HEXANE

BAUM, FRITZ. Hexan. *In* Abderhalden, *Biochem. Handl.* 1: 93-100 (1911). 110 footnotes. (Includes derivatives.)

See also HYDROCARBONS.

HEXANITRODIPHENYLAMINE

[Hexanitrodiphenylamine.] *Z. ges. Schiess.-Sprengstoffw.* 12: 233 (1917). Patents, 1891-1917.

HEXOSAMINES

LEVENE, P. A. Synthese von 2-Hexosaminsäuren und 2-Hexosaminen. *Biochem. Z.* 124: 83 (1921). 40 references.

HEXOSES. *See* CARBOHYDRATES; names of sugars.

HIDES. *See* LEATHER.

HIGH TEMPERATURE MEASUREMENTS

GILLET, H. W. Temperature measurements in carborundum furnaces. *J. Phys. Chem.* 15: 303-305 (1911). 96 references.

HIPPURIC ACID

"Hippuric acid." *Ind.-Cat. S. G. O.*, 1st ser., 1: 81 (1880); 2nd ser., 1: 111-112 (1896); 3rd ser., 1: 116 (1918).

MEYER-JACOBSON. Hippursäure. *In their* Lehrb. org. Chem. 2, pt. 1: 555 (1896).

SCHIEBLER, HELMUTH. Hippursäure. *In* Abderhalden, Biochem. Handl. 4: 429-463 (1911); 9: 88-92 (1915). About 250 footnotes. (Includes derivatives.)

HISTAMINE

GERRAED, R. W. Presence and significance of histamine in an obstructed bowel. *J. Biol. Chem.* 52: 111-124 (1922). 39 references.

See also AMINES; BASES, ORGANIC.

HISTIDINE

MEYER-JACOBSON. Histidin. *In their* Lehrb. org. Chem. 2, pt. 3: 469-473 (1916). Bibl. footnotes.

ZEMPLÉN, GÉZA. Histidin. *In* Abderhalden, Biochem. Handl. 4: 712-719 (1911); 9: 152-155 (1915). About 250 footnotes.

See also AMINO ACIDS.

HISTONE

EDDY, WALTER H. Histon and its preparation. *Biochem. Bull.* 2: 439-440 (1913). 23 references.

ROLLETT, ADOLF. Histon und Protamin. *In* Abderhalden, Biochem. Handl. 4: 157-168 (1910). 115 references.

STEUDEL, H. Histone und Protamine. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 577-584 (1922). Bibl. footnotes.

HISTORY

BASKERVILLE, CHARLES. The elements: verified and unverified. *Am. Assoc. Adv. Sci.* 53: 24-56 (1904).

BOLTON, H. C. A select bibliography of chemistry, 1492-1902. Washington, Smithsonian Inst. Section III is devoted to "History of chemistry."

DEL MAR, ALEX. A history of the precious metals from the earliest times to the present. 2nd ed. New York, Cambridge Enc. Co., 1902. 479 p. Bibl., p. xi-xxii.

GRAEBE, CARL. Geschichte der organischen Chemie. Berlin, Springer, 1920. 406 p. Bibl. footnotes.

HOFFMANN, AUGUST. Ueber den Anteil Lavoisier's an der Feststellung der das Wasser zusammensetzenden Gase. Leipzig, Barth, 1896. 57 p. Bibl., p. 17-52.

JOSEPHSON, AKSEL G. S. List of books on the history of industry and industrial arts. Chicago, John Crerar Library, 1915. 486 p. Chemical industry, p. 293-315; ceramics, p. 315-356; paper making, p. 358-362; textiles, p. 362-456.

JOSEPHSON, AKSEL G. S. List of books on the history of science. Chicago, John Crerar Library, 1911, 1917. Chemistry, p. 154-173, p. 67-71. Classified.

KAHLBAUM, GEORG W. A., and HOFFMANN, AUGUST. Die Einführung der Lavoisier'schen Theorie insbesondere in Deutschland. Ueber den Anteil Lavoisier's an der Feststellung der das Wasser zusammensetzenden Gase. Leipzig, Barth, 1897. 211 p. Bibl., p. 167-204.

LIPPMANN, EDMUND O. Chemisches bei Marco Polo. *Z. angew. Chem.* 21: 1778-1788 (1908). 254 footnotes.

LIPPMANN, EDMUND O. [Chemistry and technology from original historical scientific writings.] *Chem.-Ztg.* 40: 3-5, 26-28, 48-50 (1916). 115 footnotes.

LIPPMANN, EDMUND O. v. Beiträge zur Geschichte der Naturwissenschaften und der Technik. Berlin, Springer, 1923. 314 p. Bibl. footnotes.

LOWRY, T. M. Historical introduction to chemistry. London, Macmillan, 1915. 581 p.

MELLOR, J. W. The evolution and methodology of chemistry. *In his* Inorg. chem. 1: 1-73 (1922). About 200 references.

MEYER, ERNST VON. Geschichte der Chemie von den ältesten Zeiten bis zur Gegenwart. Leipzig, Veit, 1914. 616 p. Bibl. footnotes.

STILLMAN, JOHN M. The story of early chemistry. New York, Appleton, 1924. 556 p. Bibl., p. 541-555.

STRUNZ, FRANZ. Ueber die Vorgeschichte und die Anfänge der Chemie: eine Einleitung in die Geschichte der Chemie des Altertums. Leipzig, Deuticke, 1906. Bibl., p. 57-69. 300 references.

WRANY, ADALB. Geschichte der Chemie und der auf chemischer Grundlage beruhenden Betriebe in Böhmen bis zur Mitte des 19. Jahrhunderts. Prag, Rivnac, 1902. 397 p.

See also ALCHEMY.

HOFMANN'S REACTION

DARAPSKY, AUGUST. Ueber die Hofmann'sche Reaktion von Amid- und Hydrazinderivaten der Kohlensäure. *J. prakt. Chem.* 184: 433-466 (1907). Bibl. footnotes.

HOLMIUM. See RARE EARTHS.

HONEY

BRYAN, A. H. Bibliography of honey. U. S. Dept. Agr., Bur. Chem. Bull. No. 110, 1908. Bibl., p. 89-93. About 150 titles. With additions by F.

HONEY—*Cont'd*

- MUTTELET, in *Monit. Sci.* 74: 152-154 (1911); *J. Soc. Chem. Ind.* 30: 702-704 (1911). Covers 1892-1910.
- BRYAN, A. H. Chemical analysis and composition of imported honey from Cuba, Mexico and Haiti. U. S. Dept. Agr., Bur. Chem., Bull. No. 154, 1912. 21 p. Bibl., p. 17-21, covering 1907-1911 and supplementing the earlier list.
- KUTTENKEULER, H. Honig. *Naturwissenschaften* 3: 445 (1915). 40 references.
- MUTTELET, F. [Honey and its analysis.] *Ann. fals.* 4: 192-196 (1911).
- REINHARDT, F. Beiträge zur Untersuchung des Honigs. *Z. Nahr.-Genussm.* 20: 113-152 (1910). Bibl. footnotes.

- SPAETH, E. Honig. In *Abderhalden, Handb. biol. Arbeitsm.* 4, pt. 8: 977-1050 (1923). Bibl. footnotes.
- WILEY, H. W. Bibliography of honey. U. S. Dept. Agr., Bur. Chem. Bull. No. 13, pt. 6: 871-874 (1892).
- WITTE, H. Honiguntersuchungen. *Z. Nahr.-Genussm.* 18: 625-649 (1909); 21: 305-364 (1911). Bibl. footnotes. *Z. oeffentl. Chem.* 18: 362-373, 390-397 (1912). 66 footnotes.

See also FOODS (Vereinbarungen).

HOPS

- RABAK, FRANK. Aroma of hops—study of the volatile oils with relation to the geographical sources of the hop. *J. Agr. Res.* 2: 158-159 (1914). 28 references.

HORMONES

- WOLFF, BRUNO. Ueber fetale Hormone. In *Oppenheimer, Handb. Biochem., Ergänzungsband*, 1913, 442-495. 142 footnotes.

HORN

- MARSCHALK, F. Horn, Elfenbein und Fischbeinersatz. *Kunststoffe* 7: 185-187, 203-206 (1917). 86 patents.

HORNBLLENDE. *See* CALCIUM MAGNESIUM SILICATE.**HUMIC ACID AND HUMUS**

- ALWAY, F. J. Nitrogen content of the humus of arid soils. *J. Agr. Res.* 5: 909-916 (1916). 17 references.
- BOTTOMLEY, W. B. The formation of humic bodies from organic substances. *Biochem. J.* 9: 260-268 (1915).
- GRAFE, VIKTOR. Die Huminsubstanzen. In *Abderhalden, Biochem. Handl.* 2: 94-113 (1911); 8: 20-22 (1914). 175 footnotes.
- JODIDI, S. L. The chemistry of humus, with special reference to the relation of humus to the soil and to the

plant. *J. Franklin Inst.* 176: 565-573 (1913). About 100 references.

JODIDI, S. L. The nature of humus and its relation to plant life. *Biochem. Bull.* 3: 17-22 (1913). About 50 references.

ODEN, SVEN. Die Huminsäure. *Kolloidchem. Beiheft* 11: 81-99 (1919). 386 references.

ROXAS, M. L. Reaction between amino-acids and carbohydrates as a probable cause of humin formation. *J. Biol. Chem.* 27: 71-93 (1916). 20 footnotes.

ZEMPLÉN, GÉZA. Huminstoffe. In *Abderhalden, Biochem. Handl.* 10: 220-239 (1923). Bibl. footnotes.

HUMIT. *See* MAGNESIUM SILICATE.

HYDANTOIN

HARRIES, C., and WEISS, M. Ueber das Hydantoin und Isomeren bei den Methylhydantoinen. *Ann.* 327: 355-384 (1903). 35 footnotes.

JOHNSTON, TREAT B. Hydantoins. *J. Am. Chem. Soc.* 35: 1135-1136 (1913). 22 references.

MEYER-JACOBSON, Hydantoin. In *their Lehrb. org. Chem.* 2, pt. 3: 455-457 (1916). Bibl. footnotes.

See also PYRIMIDINES.

HYDRASTIN

"Hydrastin and hydrastinin." *Ind.-Cat. S. G. O.*, 1st ser., 6: 536 (1885); 2nd ser., 7: 501-502 (1902).

MEYER-JACOBSON, Hydrastinin. In *their Lehrb. org. Chem.* 2, pt. 3: 1030-1035 (1917).

SCHMIDT, JULIUS. Hydrastin. In *Abderhalden, Biochem. Handl.* 5: 224-234 (1911). Bibl. footnotes.

See also ALKALOIDS.

HYDRATES

FRICKE, R. [The hydration of molecules and ions.] *Kolloid-Z.* 35: 264-274 (1924). 100 references.

KENDALL, J., BOOGE, J. E., and ANDREWS, J. C. Addition compound formation in aqueous solutions. The stability of hydrates. *J. Am. Chem. Soc.* 39: 2303-2323 (1917). Bibl. footnotes.

REMY, HEINRICH. Beiträge zum Hydratproblem. I. Berechnung der Menge des die Ionen einhüllenden Wassers aus der elektrolytischen Beweglichkeiten. *Z. physik. Chem.* 89: 467-488 (1914-1915). Bibl. footnotes.

WASHBURN, EDWARD W. Die neueren Forschungen ueber die Hydrate in Lösung. *Jahrb. Radioakt. Elektronik* 5: 493-552 (1908); 6: 69-125 (1908). Bibl. footnotes.

HYDRAZINE

- BRAUN, J. v. Hydrazin. In Abegg, Handb. anorg. Chem. 3, pt. 3: 175-188 (1907). 50 references.
- BRAY, W. C., and CUY, EUSTACE J. The volumetric analysis of hydrazine by the iodic acid, bromine and hypochlorous acid methods. J. Am. Chem. Soc. 45: 858-875 (1924). 32 footnotes.
- BROWNE, A. W., and OVERMAN, D. R. Die angebliche Bedeutung der salpetrigen Säure bei der Bildung von Stickstoffwasserstoffsäure durch Oxydation von Hydrazin. Z. anorg. Chem. 94: 217-239 (1916). Bibl. footnotes.
- BROWNE, O. W., and SHETTERLY, F. F. The oxidation of hydrazine. J. Am. Chem. Soc. 29: 1305 (1907); 30: 53 (1908); 31: 221, 783 (1909). Bibl. footnotes.
- FOLPMERS, T. L'action du chlorure d'oxalyle avec des dérivés de l'hydrazine. Rec. trav. chim. 34: 34-77 (1915). 65 footnotes.
- "Hydrazine." Ind.-Cat. S. G. O., 2nd ser., 7: 502-503 (1902).
- LINNE, BR. Hydrazinsalze der Oxy-säure des Schwefels. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 641-646 (1907).
- MÜLLER, ERNST, and HERRDEGEN, LEONHARD. Einwirkung von Wasserfreiem Hydrazin auf Nitrile. J. prakt. Chem. 210: 113-155 (1921). Bibl. footnotes.
- SCHLENK, W. Hydrazin. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 190-196 (1907).
- SCHMIDT, JULIUS. Die Anwendung der Hydrazine in der analytischen Chemie. Stuttgart, Enke, 1907. 92 p. Bibl. footnotes.
- WIELAND, H. Die Hydrazine. Stuttgart, Enke, 1913. 238 p. Bibl. footnotes.

HYDRAZINO ACIDS

- DARAPSKY, AUGUST. Ueber Hydrazinosäure. J. prakt. Chem. 204: 251-327 (1917). Bibl. footnotes.

HYDRAZO COMPOUNDS

- MEYER-JACOBSON. Hydrazoverbindungen. In their Lehrb. org. Chem. 2, pt. 1: 271-276 (1895).
- JACOBSON, PAUL. [Summary of the results of the rearrangement of hydrazo compounds.] Ann. 428: 76-121 (1922). Bibl. footnotes.

HYDRIDES

- SMYTHE, J. A. Formation and decomposition of hydrides of the non-metals. Proc. Univ. Durham Phil. Soc. 5: 239-258 (1915).

HYDRIODIC ACID

- DITZ, HUGO. Jodwasserstoffsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 313-338 (1909). References through text.
- MELLOR, J. W. Hydriodic acid. In his Inorg. theor. chem. 2: 170-239 (1922). About 450 references.
- SKRABAL, A. Ueber die Einwirkung von Oxydationsmitteln auf Jodwasserstoff und die Reaktionen der Unterjodigensäure. Chem.-Ztg. 29: 550-554 (1905). Bibl. footnotes.

See also IODINE.

HYDROBROMIC ACID

- DITZ, HUGO. Bromwasserstoffsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 236-258 (1909). References through text.
- MELLOR, J. W. Hydrobromic acid. In his Inorg. theor. Chem. 2: 167-239 (1922).

See also BROMINE.

HYDROCARBONS

- BAUM, FRITZ. Grenzkohlenwasserstoffe. In Abderhalden, Biochem. Handl. 1: 22-156 (1911). Bibl. footnotes.
- BAUM, FRITZ. Aromatische Kohlenwasserstoffe. In Abderhalden, Biochem. Handl. 1: 157-368 (1911). Bibl. footnotes.
- BROOKS, BENJAMIN T. The chemistry of the non-benzenoid hydrocarbons and their simple derivatives. New York, Chem. Cat. Co., 1922. 612 p. Bibl. footnotes.
- FICHTER, FR., and KRUMMENACHER, EDUARD. Das Wesen der elektrochemischen Kohlenwasserstoffsynthese von Herman Kolbe. Helvetica Chim. Acta 1: 146-166 (1918). Bibl. footnotes.
- LESLIE, EUGENE H. The thermal decomposition of hydrocarbons. Gas Inst. News 6: 357-372 (1917). About 70 footnotes.
- LESLIE, E. H. The thermal reactions of hydrocarbons. In his Motor Fuels, p. 270-326 (1923). 150 references.
- MEYER-JACOBSON. Die Grenzkohlenwasserstoffe oder Paraffine. In their Lehrb. org. Chem. 1, pt. 1: 155-182 (1907). Die ungesättigten Kohlenwasserstoffe. *Ibid.* p. 813-892 (1907). Benzolkohlenwasserstoffe. *Ibid.* 2, pt. 1: 102-113 (1902). Bibl. footnotes.
- SIEVERS, ARTHUR F. On addition of organic acids to unsaturated hydrocarbons. Bull. Univ. Wisconsin, No. 434 (Sci. ser., 4: No. 3), 1911. 42 p. Bibl., p. 38-42.
- TROPSCH, HAN. Literatur ueber die Bildung von gasförmigen, flüssigen

HYDROCARBONS—Cont'd

und festen Kohlenwasserstoffen aus Karbiden. Ges. Abh. Kennt. Kohle 2: 203-213 (1918). Bibl. footnotes.

See also names of individual hydrocarbons, PYROGENESIS.

HYDROCARBONS: Natural.

LADOO, R. B. The natural hydrocarbons: gilsonite, elaterite, wurtzilite, grahamite, ozokerite, and others. U. S. Bur. Mines. Repts. of Investigations, No. 2121, 1920. 19 references.

See also ASPHALTS, BITUMENS.

HYDROCELLULOSE

CLIFFORD, P. H. Hydrocellulose. A summary of the literature. J. Textile Inst. 14: 69-77 (1923).

See also CELLULOSE.

HYDROCHLORIC ACID

DITZ, HUGO. Chlorwasserstoffsäure. In Gmelin-Kraut, Handb. inorg. Chem. 1, pt. 2: 75-117 (1909). References through text.

"Hydrochloric acid." Ind.-Cat. S. G. O., 1st ser., 1: 81-82 (1880); 2nd ser., 1: 112-113 (1896); 3rd ser., 1: 117 (1918). Includes toxicology.

MELLOR, J. W. Hydrochloric acid. In his Inorg. theor. chem. 2: 148-239 (1922). About 700 references.

MOORE, HUGH K. Production of hydrochloric acid by the direct union of hydrogen and chlorine. Trans. Am. Inst. Chem. Eng. 14: 91-122 (1923). Chronological, annotated references from 1801 to 1922.

RABE, H. Salzsäure. In Bräuer and d'Ans, Fortschritte, 1: 148-150 (1921). German patents.

See also CHLORINE.

HYDROCINNAMIC ACID

MEYER-JACOBSON. Hydrozimtsäure. In their Lehrb. org. Chem. 2, pt. 1: 599-600 (1902).

HYDROCYANIC ACID

"Hydrocyanic acid." Ind.-Cat. S. G. O., 1st ser., 1: 82-85 (1880); 2nd ser., 1: 113-114 (1896); 3rd ser., 1: 117-118 (1918). Includes toxicology.

MEYER-JACOBSON. Cyanwasserstoff oder Blausäure. In their Lehrb. org. Chem. 1, pt. 2: 1263-1284 (1913). Bibl. footnotes.

MOORE, WM., and WILLAMAN, J. J. Studies in greenhouse fumigation with hydrocyanic acid. Physiological effects on plants. J. Agr. Res. 11: 338 (1917). 26 references.

PREYER, W. Die Blausäure physiologisch untersucht. Bonn, 1870. 168 p. Chronological bibl. from 1802-1869.

SCHMIDT, ERNST. Blausäure, Cyanwasserstoff. In Abderhalden, Biochem. Handl. 1: 922-928 (1911). About 100 footnotes.

SPIEGEL, LEOPOLD. Cyanwasserstoff. In his Der Stickstoff, 1903, p. 636-681. Bibl. footnotes.

See also CARBON (Weigert), CYANOGEN (Wallis).

HYDROFLUORIC ACID

DITZ, HUGO. Fluorwasserstoff. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 13-34 (1909). References through text.

MELLOR, J. W. Hydrogen fluoride and hydrofluoric acid. In his Inorg. theor. chem. 2: 127-141 (1922). 125 references.

HYDROGEN

BAUER, E. Wasserstoff. In Abegg, Handb. anorg. Chem. 1, pt. 1: 100-105 (1907). 249 references.

ENGELHARDT, V. Die Elektrolyse des Wassers. In Bräuer and d'Ans, Fortschritte, 1: 449 (1921). 23 German patents.

MELLOR, J. W. Hydrogen. In his Inorg. theor. Chem. 1: 270-343 (1922). Occurrence, 50 references; preparation, 300 references; solubility, 250 references; properties, 500 references.

PRANDTL, W. Wasserstoff. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 66-94 (1907). References through text.

SABATIER, PAUL. Hydrogène. In Moissan, Chim. min., 1: 59-65 (1904). 224 footnotes.

SANDER, A. Wasserstoff. In Bräuer and d'Ans, Fortschritte 1: 14-16 (1921). German patents.

TAYLOR, HUGH S. Industrial hydrogen. New York, Chem. Cat. Co., 1921. 210 p. Bibl. footnotes.

WALKER, A. J. Hydrogen. In Friend, Textbook, 2: 10-51 (1924). Bibl. footnotes.

WENDT, G. L., and LANDAUER, R. S. Triatomic hydrogen. J. Am. Chem. Soc. 42: 930-946 (1920). 50 footnotes.

HYDROGEN ION CONCENTRATION

BEANS, H. T., and OAKES, E. T. Determination of the hydrogen-ion concentration in pure water by a method for measuring the electromotive force of concentration cells of high internal resistance. J. Am. Chem. Soc. 42: 2116-2132 (1920). 16 references, 1893-1915.

CLARK, WM. M. The determination of hydrogen ions. 2nd ed. Baltimore, Williams and Wilkins, 1921. Bibl., p. 233-303. Classified index.

HOBEL, RUDOLF. Die quantitative Bestimmung der Wasserstoff- und Hydroxylionen. In his Physikalische Chemie der Zelle, 4th ed., 1914, p. 144-198. Bibl. footnotes.

- KEMPF, RICHARD. Die heutigen Methoden zur Bestimmung des Säurecharakters gefärbter Flüssigkeiten. *Chem.-Ztg.* 41: 697-700, 706-708 (1917). 50 footnotes.
- LEEDS and NORTHRUP Co. Electro-metric methods and apparatus for determining hydrogen ion concentration. Catalog No. 75, 1920. Bibl., p. 29-30. Representative papers.
- MICHAELIS, L. Die Wasserstoffionkonzentration. Berlin, 1914.
- MICHAELIS, L. Die allgemeine Bedeutung der Wasserstoffionkonzentration für die Biologie. *In* Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, p. 10-62. 62 footnotes.
- SCHMIDT, CARL L. A., and HOAGLAND, D. R. Table of pH, H^+ and OH^- values corresponding to electromotive forces determined in hydrogen electrode measurements, with a bibliography. Univ. of Calif., Pub. Physiol. 2: 44-69 (1910). 467 references, classified.
- SORENSEN, S. P. L. Ueber die Messung und Bedeutung der Wasserstoffionkonzentration bei biologischen Prozessen. *Ergeb. Physiol.* 12: 394-398 (1912). 219 references.
- WILL CORPORATION. Hydrogen concentration. *In their* Bull. 100, 1921. Bibl., p. 13-19.
- HYDROGEN PEROXIDE**
- ANDERSON, WM. T., JR., and TAYLOR, HUGH S. The inhibition of the photochemical decomposition of hydrogen peroxide solutions. *J. Am. Chem. Soc.* 45: 650-662 (1923). 76 footnotes.
- BIRCHENBACH, L. Die Untersuchungen des Wasserstoffperoxyd. Stuttgart, Enke, 1909. 142 p. Bibl. footnotes.
- BOHNSON, VAN L. Catalytic decomposition of hydrogen peroxide by ferric salts. *J. Phys. Chem.* 25: 19-54 (1921). 58 footnotes.
- BRAUER, A. Wasserstoffperoxyd. *In* Bräuer and d'Ans, Fortschritte 1: 517-518 (1921). 64 German patents.
- FRIEND, J. N., and TWISS, DOUGLAS F. Hydrogen peroxide. *In* Friend, Textbook, 7, pt. 1: 324-362 (1924). Bibl. footnotes.
- GIRSEWALD, C. F. VON. Anorganische Peroxyde und Persalze. Braunschweig, Vieweg, 1914. 98 p. Bibl. footnotes.
- "Hydrogen peroxide." *Ind.-Cat. S. G. O.*, 1st ser., 6: 564 (1885); 2nd ser., 7: 519-521 (1902).
- LEEDS, ALBERT R. Index to the literature of peroxide of hydrogen. *Annals of N. Y. Acad. Sci.* 1: 416-426 (1880); 3: 153-155 (1884).
- MELLOR, J. W. Ozone and hydrogen peroxide. *In his* *Inorg. theor. chem.* 1: 877-961 (1922). About 400 references.
- PRANDTL, W. Wasserstoffsperoxyd, H_2O_2 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 124-148 (1907). References through text.
- SABATIER, P. Bioxyde d'hydrogène. *In* Moissan, Chim. min. 1: 261-282 (1904). 230 footnotes.
- HYDROGEN SELENIDE**
- LINNE, BR. Selenwasserstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 748-756 (1907). References through text.
- HYDROGEN SULFIDE**
- "Hydrogen sulfide." *Ind.-Cat. S. G. O.*, 1st ser., 6: 564-565 (1885); 2nd ser., 7: 521 (1902).
- LINNE, BR. Schwefelwasserstoff, H_2S . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 385-426 (1907). References through text.
- HYDROGENATION**
- ARMSTRONG, E. F., and HILDITCH, T. P. Colloids in catalytic hydrogenation. *In* Fourth report on colloid chemistry, 1922, p. 327-346. 78 references.
- BRAUER, RUDOLF. Reduktion und Hydrierung organische Verbindungen. Leipzig, Spamer, 1918. 324 p. Bibl. footnotes.
- ELLIS, CARLETON. The hydrogenation of oils, catalyzers and catalysis; and the generation of hydrogen and oxygen. 2nd ed. New York, Van Nostrand, 1919. 767 p. Bibl. footnotes.
- FREJACQUE, M. L'Hydrogénation des huiles. *Chimie & Industrie* 4: 456 (1920). 46 references.
- KARIYONE, TATSUO. [Literature on catalytic reductions with platinum and palladium.] *J. Pharm. Soc. Japan*, No. 506, 282-316 (1924). 199 references.
- MOCK, H., and BLUM, A. List of U. S., British and German patents covering the manufacture of butter substitutes, hydrogenated oils and various oils and milk products. New York, Mock and Blum, 1918. 120 p.
- MEYERHEIM, G. Die gehärteten Öle. *Fortschritte Chem.* 8: 293-307 (1913). References through text.
- VAVON, G. Empêchement stérique et hydrogénation catalytique. *Rev. gen. sci.* 35: 505-517 (1924). 65 references.
- HYDROLYSIS**
- LANDOLT-BÖRNSTEIN. Hydrolyse anorganischer Salze. *In their* Tabellen, 4th ed., 1912, 1188-1195; 5th

HYDROLYSIS—Cont'd

ed., 1923, 1165-1175. Arranged by salts.

LANDOLT-BÖRNSTEIN. Hydrolyse von Salzen mit organischen Anion. *In their Tabellen*, 4th ed., 1912, 1195-1198; 5th ed., 1923, 1175-1180. Arranged by salts.

NAUMANN, ALEX., and RÜCKER, ADOLF. Seitherige Verfahren zur Bestimmung der Hydrolyse. *J. prakt. Chem.* 182: 209-217 (1906). 66 footnotes.

See also CHEMICAL KINETICS.

HYDRONITRIC ACID

DENNIS, L. M., and BROWNE, A. W. Hydronitric acid and the inorganic trinitrides. *J. Am. Chem. Soc.* 26: 577-612 (1904); *Z. anorg. Chem.* 40: 69-109 (1904). 70 footnotes.

SCHLENK, W. Stickstoffwasserstoffsäure. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 184-189 (1907).

HYDROPYRROLE

PAULY, HERMANN. Studien in der Reihe der Hydropyrrole. *Ann.* 322: 77-130 (1902). 50 footnotes.

HYDROQUINONE

EINBECK, H. Hydrochinon. *In Abderhalden, Biochem. Handl.* 1: 626-634 (1911). 160 references.

MEYER-JACOBSON. Hydrochinone. *In their Lehrb. org. Chem.* 2, pt. 1: 420-423 (1896). Bibl. footnotes.

HYDROSULFITES

GÄRTH, J. Hydrosulfite. *In Bräuer and d'Ans, Fortschritte* 1: 1136-1138 (1921). German patents.

JELLINCK, KARL. Hydrosulfit. Stuttgart, Enke, 1911. 2 vols. Bibl., vol. 2, p. 201-224.

HYDROSULFUROUS ACID

LINNE, BR. Hydroschweflige Säure, $\text{H}_2\text{S}_2\text{O}_4$. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 430-436 (1907).

HYDROXYBENZALDEHYDE

MEYER-JACOBSON. Oxyaldehyde. *In their Lehrb. org. Chem.* 2, pt. 1: 516-524 (1896).

WITTE, E. *p*-Oxybenzaldehyd. *In Abderhalden, Biochem. Handl.* 1: 830-833 (1911). 50 footnotes. Includes derivatives.

***p*-HYDROXYBENZOIC ACID**

MEYER-JACOBSON. *p*-Oxybenzoesäure. *In their Lehrb. org. Chem.* 2, pt. 1: 635-639 (1902).

 β -HYDROXYBUTYRIC ACID

HUBBARD, ROGER S. Note on the determination of β -hydroxybutyric acid. *J. Biol. Chem.* 49: 351 (1921). 25 references.

MEYER-JACOBSON. β -Oxybuttersäure. *In their Lehrb. org. Chem.* 1, pt. 2: 577-579 (1913).

" β -Oxybutyric acid." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 109 (1918).

THIELE, A. β -Oxybuttersäure. *In Abderhalden, Biochem. Handl.* 1: 1073-1075 (1911). 65 footnotes.

HYDROXYLAMINE

BRAUN, J. v. Hydroxylamin. *In Abegg, Handb. anorg. Chem.* 3, pt. 3: 219-239 (1907). 100 references.

BRAY, W. C. Volumetric determination of hydroxylamine. *J. Am. Chem. Soc.* 41: 1363 (1919). 17 references.

EHLER, E., and SCHOTT, E. Zur Kenntniss des Hydroxylamins. *J. prakt. Chem.* 186: 289-342 (1908). Bibl. footnotes.

"Hydroxylamine." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 569 (1902).

LINNE, BR. Hydroxylaminsulfat. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 668-672 (1907).

MICHAEL, ARTHUR. Structure and reactions of hydroxylamine and its derivatives. *J. Am. Chem. Soc.* 43: 315-332 (1921). 80 footnotes.

SCHLENK, W. Hydroxylamin. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 231-240 (1907).

HYDROXYMETHYLFURFURAL

MIDDENDORP, J. A. Sur l'oxymethylfurfural. *Rec. trav. chim.* 38: 1-71 (1919). Bibl. footnotes.

HYOSCIN

"Hyoscin." *Ind.-Cat. S. G. O.*, 1st ser., 6: 733 (1883); 2nd ser., 7: 738-739 (1902).

HYOSCYAMINE

"Hyoscyamine." *Ind.-Cat. S. G. O.*, 1st ser., 6: 733 (1885); 2nd ser., 7: 739 (1902).

HYPNONE

"Hypnone." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 742 (1902).

HYPNOTICS

"Hypnotics." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 742-743 (1902).

See also PHARMACEUTICALS.

HYPOBROMOUS ACID

DITZ, HUGO. Unterbromige Säure. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 2: 258-261 (1907).

MELLOR, J. W. Hypohalous acids. *In his Inorg. theor. chem.* 2: 243-258 (1922).

HYPOCHLOROUS ACID

ABEL, EMIL. Hypochlorite und elektrische Bleiche. Halle, Knapp, 1905. 111 p. Bibl. footnotes.

BILLITER, J. Halogen-Sauerstoffverbindungen, elektrochemische Verfahren. *In Bräuer and d'Ans, Fortschritte* 1: 267-269 (1921). German patents.

- DITZ, HUGO. Unterchlorige Säure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 120-132 (1909).
See also HYPOBROMOUS ACID (Mellor).
- HYPOIODOUS ACID**
 DITZ, HUGO. Unterjodige Säure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 340-344 (1909).
 SKRABAL, A., and BUCHTA, F. Ueber die Natur und das Verhalten der wässerigen Lösungen der unterjodigen Säure. *Chem.-Ztg.* 33: 1184-1185, 1193-1195 (1909). 39 footnotes.
See also HYPOBROMOUS ACID (Mellor).
- HYPONITROUS ACID**
 BRAUN, J. v. Untersalpetrige Säure. *In* Abegg, Handb. anorg. Chem. 3, pt. 3, 196-199 (1907). 25 references.
 DIVERS, EDWARD. Hyponitrites, their properties and their preparation by sodium and potassium. *J. Chem. Soc.* 95: 125 (1899).
 SCHLENK, W. Untersalpetrige Säure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 248-252 (1907).
- HYPOPHOSPHORIC ACID**
 GUTBIER, A. Unterphosphorsäure, $H_4P_2O_6$. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 120-129 (1911).
- HYPOPHOSPHOROUS ACID**
 GUTBIER, A. Unterphosphorige Säure, H_3PO_2 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 103-111 (1911).
- HYPOPHYSIS CEREBRI**
 HAMMETT, FREDERICK S. The pharmacology of hypophyseal extracts. *In* Barker, Endocrinology and metabolism, 1: 737-765; references, 5: 115-161 (1922).
- HYPOSULFUROUS ACID**
 LINNE, BR. Unterschweiflige Säure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 571-586 (1907).
- HYPOXANTHINE**
 BRAHM, C., and SCHMIDT, J. Hypoxanthin. *In* Abderhalden, Biochem. Handl. 4: 1034-1040 (1911). Bibl. footnotes.
 MEYER-JACOBSON. Hypoxanthin. *In* their Lehrb. org. Chem. 2, pt. 3: 1267-1270 (1920).
- ICE**
 BARNES, HOWARD T. The physical constants of ice. *Trans. Roy. Soc. Canada* (3) 3, Sec. 3: 25-27 (1910). Classified by properties.
 DOBROWOLSKI, A. B. Les cristaux de glace. *Arkiv. Kem. Min. Geol.* 6: No. 7, 1916. 53 p. Bibl. footnotes.
 "Ice, manufacture, impurities, examination." *Ind.-Cat. S. G. O.*, 1st ser., 6: 770 (1885); 2nd ser., 7: 808-809 (1902).
See also REFRIGERATION, WATER.
- ICHTHYOL**
 "Ichthyol." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 810-811 (1902).
- ILMENITE**
 ZAMBONINI, F. Iminenitgruppe. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 41-54 (1918). Bibl. footnotes.
- IMIDAZOLE COMPOUNDS**
 MEYER-JACOBSON. Einkernige Imidazol-Körper. *In* their Lehrb. org. Chem. 2, pt. 3: 438-500 (1916). Bibl. footnotes.
- IMMUNITY**
 ARRHENIUS, SVANTE. Immunochemie. *Ergeb. Physiol.* 7: 480-483 (1908). 140 references.
 ARRHENIUS, SVANTE. Anwendung der physikalischen Chemie in der Immunitätslehre. *Z. Chemotherapie.* 3: 453-457 (1914). 130 references.
 BORDET, JULES. Traité de l'immunité dans les maladies infectieuses. Paris, Masson, 1920. 720 p.
 "Complement." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 88-90 (1923).
 CZAPEK, F. Immunoreaktionen. Die Kinetik der Immunoreaktionen. *In* his Biochemie der Pflanzen, 3rd ed., 1: 127-147 (1922). Bibl. footnotes.
 "Immunity." *Ind.-Cat. S. G. O.*, 2nd ser., 7: 840-849 (1902).
 KOLLE, W., and WASSERMAN, A. Handbuch der pathogenen Mikroorganismen. Jena, Fischer, 1904. Vol. 4, pts. 1 and 2. 1354 p. Bibl. through text.
 MICHAELIS, LEONOR. Die Eiweisspräcipitine. *Biochem. Centr.* 3: 693-705 (1904). 136 references.
 MÜLLER, PAUL T. Bakterien-Agglutinine und -Präzipitine. *In* Oppenheimer, Handb. Biochem. 2: 592-628 (1908). 131 footnotes.
 MÜLLER, PAUL T. Immunität gegen Bakterien. *In* Oppenheimer, Handb. Biochem. 2: 629-688 (1908). 243 footnotes.
 PETERSEN, WM. F. Protein therapy and nonspecific resistance. *New York, Macmillan*, 1922. 314 p. Bibl., p. 257-307.
 PUTTER, ERICH. Antikörper gegen Biokolloide. *In* Oppenheimer, Handb. Biochem., 2nd ed., 3: 357-509 (1925). 230 footnotes.
 RICHTIE, J. Current theories on immunity. *J. Hyg.* 2: 462-464 (1902). 106 references.
 SCHIFF, F. Agglutination. *In* Oppenheimer, Handb. Biochem., 2nd ed., 3: 262-356 (1925). 866 footnotes.

IMMUNITY—Cont'd

WELLS, H. G. Chemistry of the immunity reaction—antigens, specificity, antitoxins, agglutinins, precipitins, opsonins and related subjects. *In his* Chemical pathology, 4th ed., p. 159-236 (1920). 475 footnotes.

WELLS, H. G. The chemical aspects of immunity. New York, Chem. Cat. Co., 1925. 254 p. Bibl. at end of each chapter.

INDANTHRENE

MEYER-JACOBSON. Indanthren. *In their* Lehrb. org. Chem. 2, pt. 3: 1441-1444 (1920). Bibl. footnotes.

INDAZOLE

MEYER-JACOBSON. Indazol. *In their* Lehrb. org. Chem. 2, pt. 3: 428-436 (1916). Bibl. footnotes.

INDENE

COURTROT, CH. Indène. *Rev. gen. sci.* 34: 607-619 (1923). 150 references.

INDICAN

"Indican and indicanuria." *Ind.-Cat.* S. G. O., 1st ser., 6: 817 (1885); 2nd ser., 7: 877 (1902).

WANG, EYVIN. Om indicanuria. Videnskabselskabets skrifter. 1. Matematisknaturvidenskabelig klasse, 1900: No. 4. 156 p. Bibl., p. i-ix.

See also INDOXYL; URINE, ANALYSIS.

INDICATORS

ACREE, S. F., and SLAGLE, E. A. Theory of indicators. *Am. Chem. J.* 42: 115-147 (1909). Bibl. footnotes.

KEBLER, LYMAN F. "The more valuable literature on indicators during the last decade." *J. Am. Chem. Soc.* 17: 831 (1895). 34 references.

SALM, EDUARD. Studien ueber Indikatoren. *Z. physik. Chem.* 57: 471-501 (1907). Bibl. footnotes.

SLAGLE, EDGAR A. On the theory of indicators and the reactions of phthaleins and their salts. Thesis, Johns Hopkins Univ., 1909. 37 p. Bibl. footnotes.

THIEL, A. Der Stand der Indikator-enfrage. *Sammlung chem. chem.-tech. Vorträge* 16: 413-422 (1911). 227 references.

See also DYES, HYDROGEN ION CONCENTRATION.

INDIGO

"Indigo." *Ind.-Cat.* S. G. O., 1st ser., 6: 817 (1885); 2nd ser., 7: 878 (1902).

MEYER-JACOBSON. Das Indigoblau. *In their* Lehrb. org. Chem. 2, pt. 3: 280-323 (1915). Bibl. footnotes.

RUPE, H., and ALTENBURG, H. Indigo. *In* *Abderhalden, Biochem. Handl.* 6: 122-128 (1911). 60 footnotes.

TRUTWIN, HANS. Indigo. *In his* *Enzyklopädie der Küpenfarbstoffe*,

1920, p. 1-62. Literature through text.

WAGNER, HUGO E. Ueber Vorgänge bei der Oxydation von Indigo. *J. prakt. Chem.* 197: 377-414 (1913-1914). Bibl. footnotes.

See also DYES.

INDIUM

BROWNING, PHILIP E. Index to the literature of indium, 1863-1903. *Smithsonian Misc. Coll.*, vol. 46, No. 1571, 1909. 13 p. 110 references; chronological.

CHABRIÉ, C. Indium. *In* *Moissan, Chim. min.* 4: 134-143 (1905). 26 footnotes.

LITTLE, H. F. V. Indium. *In* *Friend, Textbook* 4: 150-163 (1917). Bibl. footnotes.

MELLOR, J. W. Indium. *In his* *Inorg. theor. chem.* 5: 387-405 (1924). Bibl. through chapter.

ROTH, W. Indium. *In* *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 1: 186-206, 957-963 (1911). References through text.

RUDORF, G. Indium. *In* *Abegg, Handb. anorg. Chem.* 3, pt. 1: 402-404 (1906). 79 references, 1863-1905.

SABATIER, PAUL. Indium. *In* *Frémy, Enc. chim.* 3, 5^e cahier; 251-252 (1884).

INDOLE

MEYER-JACOBSON. Das Indol und seine Derivate. *In their* Lehrb. org. Chem. 2, pt. 3: 213-280 (1915). Bibl. footnotes.

ZEMPLÉN, GÉZA. Indol und Indolabkönnmlinge. *In* *Abderhalden, Biochem. Handl.* 4: 840-917 (1911); 9: 226-236 (1915); 11: 312-319 (1924). Bibl. footnotes.

INDOXYL

MEYER-JACOBSON. Indoxyl. *In their* Lehrb. org. Chem. 2, pt. 3: 245-250 (1915). Bibl. footnotes.

See also INDIGO.

INDUSTRIAL CHEMISTRY

Gr. BRITAIN, Patent Office. Subject list of works on chemical technology, including oils, fats, soaps, candles and perfumery, paints, varnishes, gums, resins, india-rubber, paper and leather industries in the Patent Office. 1911. 160 p.

GUARESCHI, ICILIO. Nuova enciclopedia di chimica scientifica, tecnologica e industriale. Torino, 1906+. Numerous bibl. footnotes.

MARTIN, GEOFFREY. Industrial and manufacturing chemistry. *Inorganic*. 2 vols. 1917. *Organic*. 1 vol. 1920. New York, Appleton. Contains bibls. at beginning of each section.

ROGERS, ALLEN. Industrial chemistry; a manual for the student and the manufacturer. 3rd ed. New York, Van Nostrand, 1921. 1232 p. Bibl. at end of each chapter.

SADTLER, SAMUEL P., and MATOS, LOUIS J. Industrial organic chemistry. 5th ed. Philadelphia, Lippincott, 1923. Contains bibliographies.

THORPE, EDWARD. A dictionary of applied chemistry. Revised ed. New York, Longmans, 1921+. 6 vols. Contains references through text.

ULLMANN, F. Enzyklopädie der technischen Chemie. Berlin, Urban, 1914-1923. 12 vols. Bibl. at end of many of the articles.

Serial

Chemisch-technisches Repertorium. Uebersichtlich geordnete Mittheilungen der neuesten Erfindungen, Fortschritte und Verbesserung auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. 1862-. Material is classified under appropriate headings.

L'Industrie chimique. Revue universelle des produits chimiques et des industries annexes. 1914-. Material classified under: Mineral products, organic products, pharmaceuticals, plastics and textiles, patents.

Jahresbericht über die Leistungen der chemischen Technologie. 1855-. Since 1906, two volumes have been issued (inorganic and organic). Material is classified under the usual headings such as: Fuels, metallurgy, manufacture of chemicals, glass, ceramics, apparatus, organic chemical manufacture, carbohydrates, foods, fermentation, fibers, dyes, special organic chemical industries. Lists new books. Vols. 1-25 edited by R. von Wagner, 26- by F. Fischer.

Kunststoffe. Zeitschrift für Erzeugung und Verwendung veredelter oder chemisch hergestellter Stoffe. 1910-. Each issue contains selected abstracts dealing with various phases of applied chemistry.

Polytechnisches Centralblatt. 1835-1875. (Edited by Hülse and Weinlig.)

Reports of the Progress of applied chemistry. (Issued by the Society of Chemical Industry.) 1916-. Classification for 1924 was as follows: Plant and machinery; fuel, gas, destructive distillation, tar products; mineral oils; coloring matters and dyes; fibers, textiles, cellulose and paper; bleaching, dyeing, printing and finishing; acids, alkali, salts, etc.;

glass; iron and steel; electro-chemical and electro-metallurgical industries; ceramics, refractories and building materials; oils, fats and waxes; paints, pigments, varnishes and resins; india rubber; leather and glue; soils and fertilizers; sugars, starches and gums; fermentation industries; foods; sanitation and water purification; fine chemicals, medicinal substances and essential oils; photographic materials and processes; explosives. Bibl. footnotes.

La Revue de chimie industrielle. 1892-. Contains "Revue de la presse technique et scientifique." Classified: Organic industries; industrial minerals, analytical patents, books.

La Revue des produits chimiques. 1898-. Classified in part as follows: Analytical, apparatus and methods, technology, fuels, metallurgy, acids, alkalies and salts, agricultural chemistry, electrochemistry, ceramics, dry distillation, organic industries, bleaching, perfumes, cellulose, resins, tanning, fermentation, sugars, oils, petroleum, explosives, foods, etc.

Revue de l'ingenieur et index technique. Bibliographie mensuelle de la literature technique mondiale. 1905-. The material is classified according to a decimal system, each reference being given a number. Abstracts are printed on one side of the page only, for purposes of clipping. The headings of interest are: Chemistry, hygiene, chemicals, explosives, beverages, foods, lighting, ceramics, bleaching, metallurgy.

Technisch-chemisches Jahrbuch. 1879-1906. (Edited by R. Biedermann). This work covers the general field of industrial chemistry: Metals; acids, alkalies and salts; explosives; ceramics; fuels; sugar, starch, etc.; fermentation; fats, soaps and waxes; ethereal oils; water; foods; etc.

Zeitschrift für angewandte Chemie. 1887-. References are classified under the headings: Physical, inorganic, organic, analytical, technology, electrochemistry, physiological, pharmaceutical, agricultural, mineralogical. Patents are listed. In 1913, paged separately. Later abstracts were published as part of Chemisches Zentralblatt.

INDUSTRIAL POISONS. See POISONS, INDUSTRIAL.

INDUSTRIAL RESEARCH. See RESEARCH.

INDUSTRIAL WASTES. See WASTES.

INFUSORIAL EARTH. See DIATOMACEOUS EARTH.

INK

HINRICHSSEN, F. W. Die Untersuchungen von Eisengallustinten. Stuttgart, Enke, 1909. 140 p. Bibl. footnotes.

MITCHELL, C. AINSWORTH. Colloids in relation to the manufacture of ink. Fifth report on colloid chemistry, 1923, 47-50. 9 references.

MITCHELL, CHARLES A., and HEPPWORTH, T. C. Inks; their composition and manufacture, including methods of examination and a full list of English patents. 2nd ed., London, Griffin, 1916. 266 p.

U. S. Bureau of Standards. Inks, their composition, manufacture and methods of testing. Circular No. 95, 1920. 24 p. 22 references.

INORGANIC CHEMICALS. See ACIDS, ALKALIS and SALTS; names of individual chemicals.

INORGANIC CHEMISTRY

AEGG, R., and AUERBACH, FR. Handbuch der anorganischen Chemie. Vols. 2, pts. 1 and 2; 3, pts. 1, 2 and 3; 4, pt. 1, 2nd half, and pt. 2, issued. 1905-1921. Leipzig, Hirzel. Bibl. for each element. These are listed in their proper places in this work.

D'ANS, J. Jahresbericht ueber die Fortschritte der experimentellen anorganischen Chemie, 1910-1912. Chem.-Ztg. 35: 1281, 1291, 1305, 1322 (1911); 274 footnotes. 36: 301, 323, 346, 359, 376 (1912); 371 footnotes. 37: 633, 658, 694, 707, 721, 745 (1913); 498 footnotes.

BORCH, H. Anorganische Experimentalchemie. Fortschritte Chem. 3: 77-84, 351-359 (1910-1911).

CHEMICAL SOCIETY. Inorganic chemistry. In Annual reports on the progress of chemistry. 1+. 1904 to date. Bibl. footnotes.

FRÉMY, E. Encyclopédie chimique. 1882-1894. 10 vols. in 69 parts. Most important bibls. are listed in the proper places in this work.

FRIEND, J. N. A textbook of inorganic chemistry. 10 vols. London, Griffin, 1915+. Numerous bibl. footnotes.

GMELIN-KRAUT. Handbuch der anorganischen Chemie. 7th ed. Vols. 1, pts. 1, 2 and 3; 2, pts. 1 and 2; 3, pts. 1 and 2; 4, pt. 2; 5, pts. 1, 2 and 3 issued. Heidelberg, Winter, 1906-1915. Numerous references through text. Elements and most important compounds are listed in their proper places through this work.

GÖSSLING, W. Fortschritte der anorganischen Chemie im Jahre 1909. Z. angew. Chem. 23: 1855, 1879, 1925 (1910). 235 footnotes.

GUTBIER, A. Anorganische Experimentalchemie im Jahre 1910. Z. angew. Chem. 24: 913-923, 961-968 (1911). 173 footnotes.

GUTBIER, A. Experimentelle anorganische Chemie und Elektrochemie, 1911-1915. Z. angew. Chem. 25: 385-396, 459-468 (1912); 182 footnotes. 26: 105-131 (1913); 236 footnotes. 27: 73-96, 97-116 (1914); 338 footnotes. 28: 77, 93, 113, 131, 153, 173 (1915); 463 footnotes. 29: 69, 97, 107, 120 (1916). 179 footnotes.

HOFMANN, K. A. Neuere Fortschritte auf dem Gebiete der anorganischen Chemie. Chem.-Z. 2: 268-270, 491-492, 523-525 (1903); 78 footnotes. 3: 225-229, 501-503, 529-531, 701-704 (1904); 95 footnotes. 4: 73-76, 265-268, 481-484 (1905); 100 footnotes.

HOWE, JAS. L. Review of inorganic chemistry. J. Am. Chem. Soc. 29: 382-401 (1907); 31: 252-272 (1909); 33: 166-188 (1911); 34: 147-161 (1912); 35: 184-199 (1913); 37: 536-549 (1915). References as footnotes or through text.

KÉLER, H. v. Die wichtigsten Fortschritte auf den Gebiete der anorganischen Grossindustrie, 1908-1914. Z. angew. Chem. 22: 1396-1445 (1909); 23: 625-642 (1910); 24: 532, 579 (1911); 25: 454, 518 (1912); 26: 209-227 (1913); 27: 225, 244 (1914); 28: 177, 201, 214 (1915). Bibl. footnotes.

KLEMM, W. Fortschritte der anorganischen Chemie seit 1921. Z. angew. Chem. 38: 1-4, 26-30 (1925). 126 footnotes.

KÖPPEL, I. Bericht ueber wichtige Untersuchungen der wissenschaftlichen anorganischen Experimentalchemie aus den Jahren 1917-1920. Z. angew. Chem. 35: 49-54, 57-60, 94-95, 99-103 (1922). 160 footnotes.

MELLOR, J. W. A comprehensive treatise on inorganic and theoretical chemistry. New York, Longmans, 1922+. 5 vols. issued. Contains extensive bibls. These bibls. are listed in this work under the proper headings.

MOISSAN, HENRI. Traité de chimie minérale. Paris, Masson, 1904-1906. 5 vols. The most important of the bibls. are listed in this work.

PICK, H. Anorganische Experimentalchemie. Fortschritte Chem. 1: 97-106, 360-369 (1909); 2: 181-189 (1910).

ROSCOE, HENRY E., and SCHORLEMMER, C. A treatise on chemistry. 6th ed. London, Macmillan, 1923. 2 vols. Bibl. footnotes.

SOMMER, F. Anorganische Experimentalkemie. Fortschritte Chem. 4: 381-393 (1911); 5: 243-261 (1912); 7: 113-125 (1913); 10: 13-31 (1914-1915); 11: 51-63 (1915-1916). References through text.

Serial

Edel-Erzen und -Erze. 1919-. Each number contains abstracts, patents and books.

Kali, Zeitschrift für Gewinnung, Verarbeitung und Verwertung der Kalisalze. 1907-. Each number contains an abstract section.

Zeitschrift für anorganische Chemie. 1892-. Early volumes contained an abstract section.

See also ACIDS, ALKALIS AND SALTS; names of individual chemical compounds and properties.

INOSITE

GRAFE, VIKTOR. Die Inosite. In Abderhalden, Biochem. Handl. 2: 555-570 (1911); 8: 285-287 (1915). About 165 footnotes.

LIPPMANN, E. O. v. Inosit. In his Chemie der Zuckerarten, 1019-1032 (1895). Bibl. through text.

MEYER-JACOBSON. Inosit. In their Lehrb. org. Chem. 2, pt. 1: 807-810 (1902). Bibl. footnotes.

ZEMPLÉN, GÉZA. Inosit. In Abderhalden, Biochem. Handl. 10: 743-749 (1923). Bibl. footnotes.

See also PHYTIN.

INOSITE PHOSPHORIC ACID. See PHYTIN.

INSECTICIDES

ANDERSON, OSCAR G. Insecticides and fungicides, spraying and dusting equipment; a laboratory manual. New York, Wiley, 1923. 349 p. Contains bibls.

COOK, FRANK C., and McINDOO, N. E. Chemical, physical and insecticidal properties of arsenicals. U. S. Dept. Agr., Bull. No. 1147, 1923. 58 p. Bibl., p. 55-57.

FORNAINI, M. Rassegna dei mezzi di lotta contro i parassiti del corpo fra le truppe. Ann. chim. appl. 4: 111-128 (1915). 110 footnotes.

FUJITANI, J. Beiträge zur Chemie und Pharmacologie des Insektenpulver. Arch. exp. Path. Pharm. 61: 47-53 (1909). Bibl. footnotes.

"Insecticides." Ind.-Cat. S. G. O., 2nd ser., 8: 175-176, 181-182 (1903). Includes some patents.

JUILLET, A. Le pyrethre insecticide du Dalmatie, origine, culture, principes, actifs, applications a l'agriculture. Paris, Ministère du Commerce et de l'Industrie, 1924. 236 p. Bibl., p. 215-229.

McDONNELL, C. C. Recent progress in insecticides and fungicides. Ind. Eng. Chem. 16: 1011-12 (1924). 132 references.

McDONNELL, C. C., and ROARK, R. C. Insect powder. U. S. Dept. Agr., Bull. No. 824. 1920. 100 p. Bibl., p. 83-100. 299 references.

McINDOO, NORMAN E. Quassia extract as a contact insecticide. J. Agr. Res. 10: 528-531 (1917).

MANARESI, ANGELO. Intorno ad alcuni nuovi insetticidi ricerche ed esperienze con sali di arsenico, di bario, ecc. Bologna, Cuppini, 1909. 81 p.

MARCHAL, P. [Arsenicals and mixed sprays for fruits.] Min. Agr. (France), Ann. serv. Épiphyties 6: 242-280 (1918).

MOORE, WM. Spreading and adherence of arsenical sprays. Univ. Minn. Agr. Expt. Sta., Tech. Bull. No. 2, 1921. 50 p. Bibl., p. 46-50.

PICKNEY, REUBEN M. Action of soap upon lead arsenates. J. Agr. Res. 24: 95 (1923).

RAABE, JAN F. C. Over de waarde van sulfoliquid als antiparasiticum en antipruriginosum bij kleine huisdieren (hond en kat). Utrecht, Hajer, 1922. 172 p. Bibl., p. 165-172.

REES, CHARLES C., and MACFARLANE, WALLACE. A bibliography of recent literature concerning plant-disease prevention. Univ. Ill. Agr. Expt. Sta., Circ. No. 183, 1915. 78 p. Classified. Covers 1909-1914.

ROARK, R. C. Plants used as insecticides. Am. J. Pharm. 91: 25-37, 91-107 (1919).

ROARK, RUCIC C., and KEENAN, G. L. Adulteration of insect powder with powdered daisy flowers. U. S. Dept. Agr., Bull. No. 795 rev., 1923. 10 p. Bibl., p. 7-9.

TOMMASI, G. Rivista dei lavori recenti sugli anticrittigamici ed insetticidi. Ann. chim. appl. 3: 111-147 (1915). 175 footnotes.

See also ARSENICALS, BORDEAUX MIXTURE, DISINFECTANTS, GERMICIDES, HYDROCYANIC ACID, LEAD ARSENATE, NICOTINE.

INSECTS: Nutrition.

BAUMBERGER, J. P. Nutritional study of insects, with special reference to microorganisms and their substrata. J. Expt. Zool. 28: 1-81 (1919). Bibl. of 7 p.

INSULATING MATERIALS. See ELECTRIC INSULATORS.

INSULIN

ALLEN, F. M. Summary of publications on insulin to date. J. Metabolic Res. 2: 125-140 (1922). Annotated.

INSULIN—Cont'd

BEST, C. H., and SCOTT, D. A. The preparation of insulin. *J. Biol. Chem.* 57: 709-723 (1923). 23 references.

HEPBURN, J., and LATCHFORD, J. K. The effect of insulin (pancreatic extract) on the sugar consumption of the isolated surviving rabbit heart. *Am. J. Physiol.* 62: 183-184 (1922). Univ. of Toronto, Physiol. series, No. 52.

INSULIN COMMITTEE, Univ. Toronto. Insulin, its action, its therapeutic value in diabetes and its manufacture. *J. Can. Med. Assoc.* 13: 480-486 (1923).

MACLEOD, J. J. R. Insulin. *Physiol. Rev.* 4: 66-68 (1924).

STAUB, H. Insulin. *Klin. Wochschr.* 3: 101 (1924). 83 references.

INTERMEDIATES

CAIN, J. C. The manufacture of intermediate products for dyes. London, Macmillan, 1918. 263 p. Bibl. footnotes.

CROSSLEY, M. L. Chemistry of intermediates. *J. Ind. Eng. Chem.* 14: 802-805 (1922). 76 references.

GRAEFE, ED. Die Braunkohlenteerindustrie, 1903-1909. *Chem.-Ztg.* 28: 239-242 (1904); 46 footnotes. 29: 285-289 (1905); 62 footnotes. 30: 691-694 (1906); 57 footnotes. 31: 408-411 (1907); 80 footnotes. 32: 885-886, 903-904 (1908); 74 footnotes. 33: 1053-1055 (1909); 74 footnotes. 34: 901-904 (1910); 87 footnotes.

LANGE, OTTO. Die Zwischenprodukte der Teerfarbenfabrikation. Leipzig, Spamer, 1920. 645 p. Patents.

ROSENTHAL, THEODOR. Die Braunkohlenteerindustrie in den Jahren 1910 bis 1912. *Chem.-Ztg.* 37: 1541, 1559, 1574, 1591 (1913). 444 footnotes.

RUSSIG, F. Die Industrie der Teerprodukte. *Chem. Z.* 1: 283, 311, 343, 574, 599 (1902); 143 footnotes. 2: 179, 205, 234, 495, 531, 601, 640, 672 (1903); 200 footnotes. 3: 209, 229, 261, 749, 778, 802 (1904); 230 footnotes. 4: 413, 437, 459 (1905); 185 footnotes.

See also DYES.

INTERNAL FRICTION

BATSCHINSKI, A. J. Untersuchungen ueber die innere Reibung der Flüssigkeiten. *Z. physik. Chem.* 84: 643-706 (1913). Bibl. footnotes.

FAUST, OTTO. Literaturverzeichnis der Arbeiten ueber innere Reibung von Lösungen und Flüssigkeitsgemischen. *Z. physik. Chem.* 79: 116-123 (1912). 121 references; chronological.

KURNAKOW, N., and ŽEMČUŽNY, S. Die innere Reibung der binären Gemische. *Z. physik. Chem.* 83: 481-506 (1913). 65 footnotes.

INTERNAL PRESSURE

LEWIS, WM. C. M. Internal, molecular or intrinsic pressure—a survey of the various expressions proposed for its determination. *Trans. Faraday Soc.* 7: 94-115 (1911). 34 references.

INTERNAL SECRETIONS

BIEDL, ARTUR. Innere Sekretion. 2nd ed. 1913. Bibl., vol. 2: 395-653. PERITZ, GEORG. Nervensystem und innere Sekretion. In Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, 496-536. 196 footnotes.

See also SECRETIONS.

INTESTINES

GERHARDT, D. Ueber Darmfäulnis. *Ergeb. Physiol.* 3: 107-115 (1904). 344 references.

"Intestines, juices of." *Ind.-Cat. S. G. O.*, 2nd ser., 8: 245-246 (1903).

See also DIGESTION.

INULASE

YOUNG, V. H. Some factors affecting inulase formation in *Aspergillus niger*. *Plant World* 21: 132-133 (1918).

See also ENZYMES.

INULIN

CZAPEK, F. Die Polysaccharide der Inulingruppe. In *his Biochem. der Pflanzen*, 3rd ed., 1: 457-461 (1922). Bibl. footnotes.

ZEMPLÉN, GÉZA. Inulin. In *Abderhalden, Biochem. Handl.* 2: 184-190 (1911); 8: 46-48 (1914). 135 footnotes.

See also CARBOHYDRATES.

INAR. See STEEL, NICKEL.

INVERTASE

BLOOMFIELD, GROVER. Some characteristics of invertase action and their significance in interpreting the nature of the reaction. Thesis, Columbia Univ., 1922. 43 p. Bibl., p. 42-43.

BORN, SIDNEY. The chemical constitution of invertase. The acetolysis of carbohydrates. Thesis, Columbia Univ., 1913. 40 p. Bibl., p. 37-39. 45 references on invertase; 42 references on acetolysis.

VINSON, A. E. The endo- and ketoinvertase of the date. *J. Am. Chem. Soc.* 30: 1005-1020 (1908). About 50 footnotes.

WILLSTÄTTER, RICHARD, and RACHE, FRITZ. Zur Kenntniss des Invertins. *Ann.* 425: 1-135 (1921). Bibl. footnotes.

ZUNZ, EDGARD. Invertase. *In* Abderhalden, *Biochem. Handl.* 5: 539-543 (1911). 100 footnotes.

See also ENZYMES.

IODIC ACID

DITZ, HUGO. Jodsäure. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 348-364 (1909). References through text.

MELLOR, J. W. Iodic acid and its salts. *In his* *Inorg. theor. chem.* 2: 296 (1922).

See also IODINE.

IODIMETRY

BARNIBEY, O. L. Differential iodimetry. *J. Am. Chem. Soc.* 38: 330-341 (1916). About 50 references.

See also ANALYTICAL CHEMISTRY.

IODINE

ABEL, E., and HALLER, F. *Jod. In* Abegg, *Handb. anorg. Chem.* 4, pt. 2: 560-589 (1912). 1512 references.

DITZ, HUGO. *Jod. In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 285-313 (1909). References through text.

"Iodine and compounds." *Ind.-Cat. S. G. O.*, 1st ser., 7: 87-93 (1886); 2nd ser., 8: 322-327 (1903).

JOLY, A. *Iode. In* Frémy, *Enc. chim.* 2, 1^{er} cahier: 691-693 (1885).

LEBEAU, P. *Iode. In* Moissan, *Chim. min.* 1: 151-187 (1904). 585 footnotes.

LOTTERMOSER, A. Kolloidchemie des Jods. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 2: 597-598 (1912). 34 references.

MARTIN, G., and DANCATER, E. A. *Iodine. In* Friend, *Textbook*, 8: 189-255 (1915). *Bibl. footnotes.*

MELLOR, J. W. *Iodine. In his* *Inorg. theor. chem.* 2: 15-126 (1922). Occurrence, 40 references; history, 10 references; preparation, 80 references; properties, 185 references; colloidal iodine, 50 references; color of solutions, 35 references.

IODINE: Analytical.

DITZ, HUGO. *Jod-Analytisches. In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 311-312, 334-338, 435, 438 (1909).

IODINE: Biochemistry.

CAMERON, A. T., and CARMICHAEL, J. Biochemistry of iodine. III. Comparative effects of thyroid and iodine feeding on growth in rats and rabbits. *J. Biol. Chem.* 45: 69 (1921). 25 references.

WHEELER, H. L., and MENDEL, L. B. The iodine complex in sponges. 3, 5-Diiodotyrosine. *J. Biol. Chem.* 7: 1-9 (1910). 25 references.

IODINE: Organic compounds.

WILLGERODT, CONRAD. Die organischen Verbindungen mit mehrwertigem Jod. Stuttgart, Enke, 1914. 265 p. *Bibl. footnotes.*

IODINE: Pharmacology.

BOYD, L. J., and NAST, A. G. Study of the action of iodine. *J. Am. Inst. Homeopathy* 17: 729-734 (1924). 50 references.

IODINE CHLORIDES

DITZ, HUGO. *Jod und Chlor. In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 394-402 (1909). References through text.

MELLOR, J. W. Chlorine and iodine. *In his* *Inorg. theor. chem.* 2: 116-122 (1922). 50 references.

IODINE COULOMETER

WASHBURN, EDWARD W., and BATES, STUART J. The iodine coulometer and the value of the Faraday. *Trans. Am. Electrochem. Soc.* 22: 397-433 (1912). About 40 footnotes.

IODINE PENTOXIDE

DITZ, HUGO. *Jodpentoxyd. In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 346-348 (1909).

MELLOR, J. W. Iodine pentoxide. *In his* *Inorg. theor. chem.* 2: 293-295 (1922). 50 references.

IODIPIN

"Iodipin." *Ind.-Cat. S. G. O.*, 2nd ser., 8: 327-328 (1903).

IODOFORM

BAUM, FRITZ. Iodoform. *In* Abderhalden, *Biochem. Handl.* 1: 45-47 (1911). 75 footnotes.

"Iodoform." *Ind.-Cat. S. G. O.*, 1st ser., 7: 93-96 (1886); 2nd ser., 8: 328-331 (1903).

MEYER-JACOBSON. Iodoform. *In their* *Lehrb. org. Chem.* 1, pt. 2: 16-19 (1913). *Bibl. footnotes.*

IONIZATION

KENDALL, J., and BOOGE, J. E. The mechanism of the ionization process. *J. Am. Chem. Soc.* 39: 2323-2333 (1917). *Bibl. footnotes.*

STARK, J. Bericht ueber die Ionisierung der chemischen Elemente durch Elektronstoff. *Jahrb. Radioakt. Elektronik* 13: 396-400 (1916). 85 references.

See also ELECTRICAL CONDUCTIVITY.

IRIDIUM

FRIEND, J. N. Iridium. *In his* *Textbook*, 9, pt. 1: 235-255 (1920). *Bibl. footnotes.*

LEIDIE, E. Iridium. *In* Frémy, *Enc. chim.* 3, 17^e cahier: 267-272 (1901).

PÉCHARD, —. Iridium. *In* Moissan, *Chim. min.* 5: 893-925 (1906). 188 footnotes.

See also PLATINUM (Howe); RARE EARTHS.

IRIDIUM OXIDE

- WOHLER, LOTHAR, and WITZMANN, W. Die Oxyde des Iridiums. *Z. anorg. Chem.* 57: 323-352 (1908). 50 footnotes.

IRON

- BLUMHOF, JOHANN G. R. Volständige systematische Literatur von Eisen, in mineralogischer, chemischer, technologischer, ökonomischer, cameralistischer und medicinischer Rücksicht. Braunschweig, 1803. 271 p.

- FRIEND, J. NEWTON. Iron and its compounds. In *his* Textbook, 9, pt. 2, 1921. 265 p. Bibl. footnotes.

- GT. BRIT. Library of the Patent Office. Subject list of works on mineral industries in the library of the Patent Office. Part 2. Iron manufactures, alloys and metallography. 1912. 70 p.

- "Iron and compounds." *Ind.-Cat. S. G. O.*, 1st ser., 7: 117-124 (1886); 2nd ser., 8: 353-359 (1903).

- JOANNIS, M. Le fer et ses composés. In Frémy, *Enc. chim.* 3, 9^e cahier: 153-162 (1884). Classified by compounds.

- McCLELLAND, E. H. Review of iron and steel literature. A classified list of the more important books, serials and trade publications during the year; with a few of earlier date, not previously announced. Blast Furnace Steel Plant 8: 8-10 (1920); 9: 6-8 (1921); 10: 4-8 (1922); 11: 7-11 (1923); 12: 13-17 (1924). Issued as a reprint by the Carnegie Library of Pittsburgh.

- METZNER, R. Fer. In Moissan, *Chim. min.* 4: 297-437 (1905). 1156 footnotes.

- MUELLER, ERICH. Das Eisen und seine Verbindungen. Dresden, Steinkopff, 1917. 558 p. Bibl., p. 390-419. 1129 references. Author index. Alloys, p. 549-553. 218 references.

- ROOZEBOOM, H. W. B. Eisen und Stahl vom Standpunkte der Phasenlehre. *Z. physik. Chem.* 34: 437-488 (1900). Bibl. footnotes.

- SOCIETY OF CHEMICAL INDUSTRY. Iron and steel. In Reports of the progress of applied chemistry, 2: 242-261 (1917); 3: 209-223 (1918); 4: 202-225 (1919); 5: 229-248 (1920); 6: 257-273 (1921); 7: 216-229 (1922); 8: 233-250 (1923); 9: 226-249 (1924). Bibl. footnotes.

IRON: Alloys.

- ALLEMAN, G., and DARLINGTON, C. J. Occluded gases in ferrous alloys. *J. Franklin Inst.* 185: 161-198, 333-357, 461-480 (1918). 40 footnotes.

- ARNOLD, J. O., and READ, A. A. Chemical and mechanical relations of iron, tungsten, nickel and carbon. *Engineering* 97: 433-436.

- AUSTRALIA. Advisory council of science and industry. The manufacture and uses of ferro-alloys and alloy steels, being the report of a special committee appointed to investigate the manufacture of ferro-alloys and alloy steels from the raw materials occurring in Australia. Melbourne, 1918. 46 p. Bibl., p. 45-46.

- BERGGREEN, PAUL H. Bibliography of the different forms and combinations of carbon and iron, including those in iron alloys. *Bull. Am. Inst. Mining Eng.* 1914, 914-927.

- BIBLIOGRAPHY of patents covering unions of copper or its alloys with iron or steel by the aid of heat. *J. Ind. Eng. Chem.* 5: 893-895 (1913).

- BUCK, E. C. Bibliography of the manufacture of ferromanganese. *Met. Chem. Eng.* 17: 638-642 (1917).

- CHENEY, W. L. Preparation and properties of pure iron alloys. *U. S. Bur. Standards, Bull.* 18: 635; *Sci. Paper No.* 463, 1923. 50 references.

- KRÖHNKE, O. Kurze Einführung in den inneren Gefügebau der Eisenkohlenstofflegierungen. Berlin, 1911. Bibl., p. 77-110. Arranged by authors.

- LEVY, DONALD M. Study of the manganese sulfides and silicates in iron and steel. *Iron and Steel Inst., Carnegie Scholarship Mem.* 3: 279-281 (1911). 48 references.

- STEAD, J. E. Some of the ternary alloys of iron, carbon and phosphorus. *J. Soc. Chem. Ind.* 33: 184 (1914). 41 references.

See also ALLOYS; STEEL.

IRON: Analytical.

- ARDAUGH, E. R. G., and BROUGHALL, G. M. Method of separating nickel and copper from iron. *Can. Chem. Met.* 17: 198-200 (1923). 22 references.

- BARNEBEY, O. L. Permanganate determination of iron in the presence of chlorides. *J. Am. Chem. Soc.* 36: 1447-1448 (1914). 65 references.

- MACALLUM, A. B. Eisen in den Geweben und Zellen. *Ergeb. Physiol.* 7: 552-556 (1908). 94 references.

- PULSIFER, H. B. Colorimetric estimation of iron. *J. Am. Chem. Soc.* 26: 974-975 (1904). 50 references.

- PULSIFER, H. B. The determination of sulfur in iron and steel. *J. Ind. Eng. Chem.* 8: 1119-1123 (1916).

Chronological, 1797-1916. Brief comments. *Also in his* Determination of sulfur in iron and steel, Easton, Chem. Pub. Co., 1922. Bibl., p. 53-155.

IRON: Biochemical.

MEYER-ERICH. Ueber die Resorption und Ausscheidung des Eisens. *Ergeb. Physiol.* 5: 698-702 (1906). 125 references.

IRON: Case hardening. *See* CASE HARDENING.

IRON: Cast.

HURST, J. EDGAR. Cast iron, with special reference to engine cylinders. *Engineering* 103: 40-41, 51-54, 75-76 (1917).

PORTER, JOHN J. Chemical standards for iron castings. *Trans. Am. Foundryman's Assoc.* 19: 134-149 (1911). Alphabetical list of castings with analyses. 201 references.

Malleable cast iron. *In* British cast iron research assoc., Bull. No. 1: 10-14 (1923). 130 references.

SCHWARTZ, H. A. American malleable cast iron. Cleveland, Fenton Pub. Co., 1922. 416 p. Bibl., p. 385-402. 150 references, classified and annotated.

IRON: Crystallization.

MELLOR, J. W. The crystallization of iron and steel. New York, Longmans, 1905. 144 p. Bibl. footnotes.

IRON: Electrolytic.

BELCHER, DONALD. Progress in electrolytic iron. *Trans. Am. Electrochem. Soc.* 45: 157-172 (1924). 30 footnotes.

CAIN, J. R., SCHRAMM, E., and CLEAVES, H. E. Preparation of pure iron and iron-carbon alloys. *Bull. U. S. Bur. Standards* 13: 1-26 (1916-1917); *Sci. Paper* No. 266. 21 references.

HUGHES, W. E. On the electrodeposition of iron. *Gt. Brit., Dept. Sci. Ind. Res., Bull.* No. 6, 1922. 50 p. Bibl., p. 44-50. 120 references. Contains the most important literature.

KERN, E. F. The electrolytic refining of iron. *Trans. Am. Electrochem. Soc.* 13: 103-119 (1908). Bibl. footnotes.

NEUBURGER, ALBERT. Die Fortschritte der Elektrometallurgie des Eisens. *Z. angew. Chem.* 20: 97-108 (1907). 36 footnotes.

STOREY, OLIVER W. Review of recent progress in electrolytic iron. *Trans. Am. Electrochem. Soc.* 29: 366-367 (1916). *Supplements Kern.* 15 references.

YENSEN, T. D. Magnetic and other properties of electrolytic iron melted

in vacuo. *Univ. of Ill., Eng. Expt. Sta., Bull.* No. 72, 1914. Bibl., p. 70-71. 60 references.

IRON: Galvanized.

HEISE, GEORGE W., and CLEMENTE, AMANDO. The stripping and analysis of galvanized iron. *Philipp. J. Sci.* 11A: 135-146 (1916). 31 footnotes.

IRON: History.

FRIEND, J. N. Iron in antiquity. *Iron Steel Inst., Carnegie Scholarship Mem.* 12: 219-290 (1923). Bibl. footnotes.

MEYER, OSWALD. *Geschichte des Elektroeisens.* Berlin, Springer, 1914. 182 p. Bibl. footnotes.

IRON: Industry.

BROOKS, A. H., and LA CROIX, N. F. The iron and associated industries of Lorraine, the Sarre district, Luxemburg and Belgium. *U. S. Geol. Sur., Bull.* No. 703, 1920. 131 p. Bibl., p. 125-127. 73 references. 1904-1919.

COMITÉ DES FORGES DE FRANCE, Paris. *Bibliothèque. Catalogue de la bibliothèque du Comité des forges de France.* Rennes, Simon, 1902. 166 p. 1049 entries.

GRIFFIN, A. P. C. Select list of books relating to iron and steel in commerce. Washington, Library of Congress, 1907. 25 p.

LEVANVILLE, J. *L'industrie du fer en France.* Paris, Colin, 1922. 211 p. Bibl. at end of chapters.

IRON: Metallurgy.

DORNHECKER, K. Ueber die Fortschritte auf dem Gebiete der Eisenhüttenkunde in den letzten Jahren. *Z. angew. Chem.* 33: 96-100, 103-104, 106-111 (1920). 100 footnotes.

GEIGER, C. *Handbuch der Eisen und Stahlgiesserei.* Berlin, Springer, 1911. 2 vols. Bibl. at end of chapters.

HADFIELD, ROBERT. Method of producing sound ingots. *J. Iron Steel Inst.* 86, pt. 2: 30-38 (1912); *Proc. Am. Railway Eng. Assoc.* 14: 466-475. 200 references, covering 1873-1912.

JUPTNER, HANS v. *Grundzüge der Siderologie.* Leipzig, Felix, 1900. 3 vols. Bibl., vol. 1: 291-307; vol. 2: 388-399; vol. 3: 400-418.

LEBEDUC, A. *Handbuch der Eisenhüttenkunde.* 5th ed. Leipzig, Felix, 1906. 3 vols. Bibl. at end of chapters.

NEUMANN, BERNHARD. *Technische Fortschritte im Eisenhüttenwesen.* *Z. angew. Chem.* 21: 2305-2311 (1908); 94 footnotes. 22: 1746-1757 (1909); 121 footnotes. 23: 1745-

IRON: Metallurgy—Cont'd

1751 (1910); 74 footnotes. 24: 2451-2459 (1911); 95 footnotes.

NEUMANN, B. Das Eisenhüttenwesen in dem Jahren 1914-1915. Glückauf 52: 1073, 1105, 1128 (1916). Bibl. footnotes.

NEUMANN, B. Das Eisenhüttenwesen. Glückauf 41: 961-971 (1905); 42: 879-889 (1906); 43: 1104-1113 (1907); 44: 1177-1187 (1908); 45: 1179-1185, 1216-1221 (1909); 46: 1811-1815, 1845-1852 (1910); 47: 1875-1882, 1911-1917 (1911); 48: 2071-2078, 2104-2112 (1912); 49: 2102-2111, 2145-2151 (1913); 51: 191, 214, 235 (1915); 52: 1075, 1105, 1128 (1916). Bibl. footnotes.

OSANN, BERNHARD. Lehrbuch der Eisenhüttenkunde. Leipzig, Engelmann, 1915. 2 vols. Bibl. footnotes. *See also* vol. 1, p. 83-89.

SIMMERSBACH, OSKAR. Die Fortschritte der Eisenhüttenchemie in den letzten fünf Jahren. Chem.-Ztg. 34: 1233, 1246, 1254, 1269, 1286, 1294 (1910). 626 footnotes.

STOUGHTON, BRADLEY. The metallurgy of iron and steel. 3rd ed. New York, McGraw, 1923. Bibl., p. 493-499.

TURNER, THOMAS. The metallurgy of iron. 4th ed. London, Griffin, 1915. 486 p. Bibl. footnotes.

IRON: Metallurgy-electric furnace.

DICKMANN, HERBERT. Bibliographie ueber die Darstellung des Roheisens im elektrischen Ofen. Duesseldorf, Stahleisen.

JUDSON, LYMAN C., and MARTIN, HARRY P. The electric furnace in the iron foundry. Trans. Am. Electrochem. Soc. 41: 127-136 (1922). 45 titles, 1913-1922. Annotated.

LECHATLIER, C. Electrometallurgy of iron. Rev. Métall. 5: 85-109 (1908).

LYON, DORSEY, and KEENEY, ROBERT N. Electric furnaces for making iron and steel. U. S. Bur. Mines, Bull. No. 67, 1914. 142 p. Bibl., p. 134-136. 58 references.

STANSFIELD, A., and WISSLER, W. A. The smelting of titaniferous ores of iron. Trans. Roy. Soc. Canada 10: 43-44 (1916). 17 references.

See also ELECTRIC FURNACE.

IRON: Ores.

BARRETT, GUY, and ROGERSON, T. B. Notes on the present knowledge and practice in regard to the briquetting of iron ores. Trans. Iron Steel Inst. 96, pt. 2: 43-48 (1917). 111 references.

BURCHARD, E. F. Iron ores, pig iron and steel. U. S. Geol. Sur., Mineral Resources, 1911, pt. 1: 168-174. 219

references. 1916, pt. 1: 559-564. 133 references.

ECKEL, E. C. Iron ores; their occurrence, valuation and control. New York, McGraw, 1914. 430 p. Bibl. through text.

ROESLER, MAX. The iron ore resources of Europe. U. S. Geol. Sur., Bull. No. 706, 1921. Bibl., p. 124-148. By countries.

IRON: Physical properties.

BURGESS, G. K., and CROWE, J. J. Critical ranges A_2 and A_3 of pure iron. Trans. Am. Inst. Mining Eng. 46: 702-703 (1911); Bull., No. 82: 2573-2575; U. S. Bur. Standards, Bull. 10: 315-370 (1913). 80 references.

HADFIELD, R. A. Experiments on the effect on mechanical and other properties of iron and its alloys produced by liquid air temperatures. J. Iron Steel Inst. 1905, 1: 206-210. 75 references.

JUPTNER, HANS v. Beziehungen zwischen den mechanischen Eigenschaften, der chemischen Zusammensetzung, dem Gefüge und der Vorbehandlung von Eisen und Stahl. 2nd ed., Leipzig, 1920. 2 vols.

NORBURY, A. L. Effect of various elements on the electrical resistivity of iron. J. Iron Steel Inst. 101: 627-644 (1920). 33 references.

OERTEL, W. Festigkeitseigenschaften von Eisen und Stahl in der Kälte und Wärme. Stahl u. Eisen 43: 1403-1404 (1923). 54 references.

WEVER, FRANZ. Zur Physik des technischen Eisen. Naturwissenschaften 12: 1114 (1924). 85 references.

IRON: Pickling.

POLANSKY, VICTOR S. Pickling of iron and steel—a bibliography. Blast Furnace Steel Plant 12: 326-328, 368-371, 431-434 (1924). Classified and annotated.

IRON: Rust-proofing. *See* CORROSION.

IRON: Testing. *See* MATERIALS: TESTING.

IRON BACTERIA

HARDER, E. C. Iron depositing bacteria and their geologic relations. U. S. Geol. Sur., Prof. Paper No. 113, 1919. 89 p. Bibl., p. 84-85. 69 references.

IRON CARBIDE

HÖNIGSCHMID, O. Eisencarbid, Fe_3C . In Doelter, Handb. Mineralchem. 1: 548-552 (1912). Bibl. footnotes.

See also CARBIDES, IRON ALLOYS.

IRON CARBONATE

LEITMEIER, H. Ferrocarbonat ($FeCO_3$). In Doelter, Handb. Mineralchem. 1: 418-440 (1912). Bibl. footnotes.

IRON CARBONYLS

FIELDNER, A. C., and JONES, G. W. Iron carbonyls: their physical and chemical properties. *Am. Gas. Assoc. Mo.* 6: 447 (1924). 29 references.

IRON PEROXIDE

MANCHOT, W. Ueber Peroxybildung beim Eisen. *Ann.* 325: 105-124 (1902). 36 footnotes.

IRON PHOSPHATES

LEITMEIER, H. Eisenoxydphosphate. *In* Doelter, *Handb. Mineralchem.* 3, pt. 1: 526-546 (1918). Bibl. footnotes.

IRON SILICATES

DOELTER, C. Eisen und Mangansilicate. *In his* *Handb. Mineralchem.* 2, pt. 3: 315-323 (1921). Bibl. footnotes.

DOELTER, C. Eisenchlorite. *In his* *Handb. Mineralchem.* 2, pt. 3: 323-355 (1921). Bibl. footnotes.

DOELTER, C. Mangan- und Eisenoxydulgranate. *In his* *Handb. Mineralchem.* 2, pt. 3: 355-385 (1921). Bibl. footnotes.

IRON SULFATE

WIRTH, F., and BAKKE, B. Untersuchungen ueber Ferrisulfate. *Z. anorg. Chem.* 87: 13-46 (1914). Bibl. footnotes.

ISATIN

DOHRN, M., and THIELE, A. Isatin. *In* Abderhalden, *Biochem. Handl.* 1: 1291-1295 (1911). Bibl. footnotes.

MEYER-JACOBSON. Isatin. *In their* *Lehrb. org. Chem.* 2, pt. 3: 257-268 (1915). Bibl. footnotes.

ISOAMYL ALCOHOL

GERNGROSS, OTTO. Isoamylalkohol. *In* Abderhalden, *Biochem. Handl.* 1: 444-450 (1911). 130 references (includes derivatives).

See also ALCOHOLS.

ISOBUTYL ALCOHOL

GERNGROSS, OTTO. Isobutylalkohol. *In* Abderhalden, *Biochem. Handl.* 1: 437-442 (1911). Bibl. footnotes.

See also ALCOHOLS.

ISOBUTYL BROMIDE

MICHAEL, A. The rearrangement of iso- into tertiary-butyl bromide. *J. Am. Chem. Soc.* 38: 653-675 (1916). 30 footnotes.

ISOBUTYRIC ACID

SCHMIDT, ERNST. Isobuttersäure. *In* Abderhalden, *Biochem. Handl.* 1: 968-973 (1911). 110 footnotes (includes derivatives).

See also ACIDS, ORGANIC.

ISOCAMPHANE

LIPP, PETER. Ueber Isocamphan. *Ann.* 382: 265-305 (1911). Bibl. footnotes.

ISOLEUCINE

ZEMPLÉN, GÉZA. Isoleucin. *In* Abderhalden, *Biochem. Handl.* 4: 578-583 (1911). 70 footnotes.

See also AMINO ACIDS.

ISOMALTOSE

NEUBERG, C., and REWALD, B. Isomaltose. *In* Abderhalden, *Biochem. Handl.* 2: 414-416 (1911).

See also CARBOHYDRATES.

ISOMERISM

LOWRY, T. M. Dynamic isomerism. *Rept. Brit. Assoc. Adv. Sci.* 1904, p. 193-224. Bibl. footnotes.

MICHAEL, ARTHUR. Configuration of organic compounds and their relation to chemical and physical properties. *J. Am. Chem. Soc.* 40: 704-723, 1674-1707 (1918). Bibl. footnotes.

MONTAGNE, P. J. [Structure problems in organic chemistry.] *Chem. Weekblad* 13: 926-947 (1916).

WARDER, ROBT. B. Bibliography of geometrical isomerism. *Proc. Am. Assoc. Adv. Sci.* 29: 130-136 (1890).

ISOMORPHISM

HLAWATSCH, C. Bemerkung zur Definition des Isomorphismus. *Z. Kryst.* 51: 417-420 (1913). 119 references.

ISOPRAL. *See* SEDATIVES.**ISOPRENE**

MEYER-JACOBSON. Isopren. *In their* *Lehrb. org. Chem.* 1, pt. 1: 886 (1907). 17 references.

See also HYDROCARBONS; RUBBER, SYNTHETIC.

ISOPROPYL ALCOHOL

CURME, GEORGE O., JR. Isopropanol. *Chem. Met. Eng.* 25: 1049 (1921). Bibl. footnotes.

GERNGROSS, OTTO. Isopropylalkohol. *In* Abderhalden, *Biochem. Handl.* 1: 428-430 (1911). 60 footnotes.

See also ALCOHOLS.

ISOPROPYLBENZENE

BAUM, FRITZ. Isopropylbenzol (Cumol). *In* Abderhalden, *Biochem. Handl.* 1: 281-285 (1911). 45 references.

See also HYDROCARBONS.

ISOQUINOLINE

KAUTZSCH, KARL. Isochinolin. *In* Abderhalden, *Biochem. Handl.* 1: 1428-1488 (1911). Bibl. footnotes.

MEYER-JACOBSON. Die Isochinolin-Gruppe. *In their* *Lehrb. org. Chem.* 2, pt. 3: 1014-1048 (1918). Bibl. footnotes.

ISOTHIAZOLE

MEYER-JACOBSON. Isothiazol- und Thiazol-Körper. *In their* *Lehrb. org. Chem.* 2, pt. 3: 533-558 (1916).

ISOTOPIES

- ASTON, F. W. Atomic weights and isotopes. *J. Franklin Inst.* 193: 581-608 (1922).
- ASTON, F. W. *Isotopes*. London, Arnold, 1922.
- BRUNETTI, RITA. Sulla isotopia degli elementi. *Nuovo cimento* 22: 38-42 (1921). 100 references.
- DAMIENS, A. *Les isotopes*. Paris, Gauthier, 1923. 118 p.
- FAJANS, K. Radioaktivität und die neueste Entwicklung der Lehre von den chemischen Elementen. Vieweg, 1921. Chapters 6-8 deal with isotopes in the radioactive group, chapter 11 with the detection of isotopes by positive ray analysis.
- HARKINS, WM. D. The stability of atom nuclei, the separation of isotopes and the whole number rule. *J. Franklin Inst.* 194: 645-681, 783-814 (1922); 195: 67-106 (1923). 100 footnotes.
- MEYER, STEFAN. Zur Frage nach der Existenz von Isotopen mit gleichem Atomgewicht. *Z. physik. Chem.* 95: 407-433 (1920). Bibl. footnotes.
- MULLIKEN, R. S., and HARKINS, W. D. The separation of isotopes. *J. Am. Chem. Soc.* 44: 37-65 (1922). 28 references.

ISOXAZOLE COMPOUNDS

- MEYER-JACOBSON. Isoxazole-Körper. *In their Lehrb. org. Chem.* 2, pt. 3: 500-520 (1916). Bibl. footnotes.

ISOVALERIC ACID

- SCHMIDT, ERNST. Isovaleriansäure. *In Abderhalden, Biochem. Handl.* 1: 977-983 (1911). 125 footnotes. Includes derivatives.
- See also ACIDS, ORGANIC.*

IVORY

- FISCHER, E. J. Ersatzmittel für Elfenbein. *Kunststoffe* 6: 101-103, 116-119 (1916). 34 patents.
- MARSCHALK, F. Horn, Elfenbein und Fischbeinersatz. *Kunststoffe* 7: 85-187, 203-206 (1917). 86 patents.

JADE

- BAUER, MAX. Nephrit und Jadeit. *In Doelter, Handb. Mineralchem.* 2, pt. 1: 649-704 (1914). Bibl. footnotes.
- BISHOP, HEEER R. Investigation and studies of jade. New York, 1906. 2 vols. Bibl., vol. 1: 257-260. 42 references.
- WELTER, OTTO A. Bericht ueber neuere Nephritarbeiten. *Geolog. Rundschau* 2: 75 (1911).
- See also PRECIOUS STONES.*

KAOLIN

- ENDELL, K. Ueber die chemische und mineralogische Veränderung basischer Eruptivgesteine bei der

Zersetzung unter Mooren. *Neues Jahrb. Mineral. Geol.* 31: 49-54 (1911). 102 references.

- LOGAN, WM. N. Kaolin of Indiana. Indiana, Dept. Conservation, Pub. No. 6, 1919. 131 p. Bibl., p. 13-14.
- LONDON, Museum of practical geology. Note on the literature of kaolin. *In Handbook to the collection of kaolin, china clay and china stone in the Museum of practical geology*, 1914, p. 254-259.
- RIEKE, REINHOLD. Kaolin. *In Doelter, Handb. Mineralchem.* 2, pt. 2: 98-103 (1917). Bibl. footnotes.
- ROSNER, H. Beiträge zur Kenntniss einiger Kaolinlagerstätten. *Neues Jahrb. Mineral. Geol.* 14: 231-243 (1901). 303 references.
- SPROAT, IRA E. Refining and utilization of Georgia kaolins. *U. S. Bur. Mines, Bull.* No. 128, 1916. 59 p. Bibl., p. 15-17.
- STREMMER, H. Die Chemie des Kaolins. *Fortschr. Mineral.* 2: 87-128 (1912). Bibl. footnotes.
- STREMMER, H. Kaolin. *In Doelter, Handb. Mineralchem.* 2, pt. 2: 77-89 (1917). Bibl. footnotes.
- STREMMER, H. Die Genesis des Kaolins in der Literatur. *In Doelter, Handb. Mineralchem.* 2, pt. 2: 130-134 (1917). Bibl. footnotes.
- KEFIR.** *See KUMISS.*
- KERATIN**
- STRAUSS, E. Die Keratine. *In Abderhalden, Biochem. Handl.* 4: 193-197 (1911). Bibl. footnotes.
- KEROSENE.** *See PETROLEUM.*
- KEROSENE: Testing.**
- ELLIOTT, ARTHUR H. Literature relating to the testing and safety of kerosene oil. *In 2nd Annual Rept., N. Y. State Board Health*, 1882, p. 484-491. Annotated.
- KETONES**
- HARRIES, C. Zur Kenntniss der Reaktionen ungesättigter Ketone. *Ann.* 330: 185-228 (1904). 125 footnotes.
- MEYER-JACOBSON. Ketone. *In their Lehrb. org. Chem.* 1, pt. 1: 716-785, 1015-1032 (1907). 2, pt. 1: 488-496 (1896). Bibl. footnotes.
- STRAUSS, FRITZ. Ueber die Bindungsart der Halogenatome bei den Ketohalogeniden ungesättigten Ketone. *Ann.* 370: 315-367 (1909). 74 footnotes.
- THIELE, ALBRECHT. Ketone der aliphatischen Reihe. *In Abderhalden, Biochem. Handl.* 1: 783-807 (1911). About 500 footnotes.
- VÖRLÄNDER, D. Addition von Säuren und Salzen zu α,β -ungesättigten Ketone. *Ann.* 341: 1-80 (1905); 150

footnotes. 345: 155-250 (1906); 50 footnotes.

WITTE, E. Ketone der aromatischen Reihe. *In* Abderhalden, *Biochem. Handl.* 1: 862-904 (1911). *Bibl. footnotes.*

KETONIC ACIDS

ERLENMEYER, E., JR. Ueber α -Keton-säuren und ihre Umwandlungen. *Ann.* 333: 160-227 (1904). 45 footnotes.

KIDNEY

FÜRTH, OTTO v. Chemische Physiologie Nierensekretion niederer Tiere. *Ergeb. Physiol.* 1: 395-398 (1902). 96 references.

MAGNUS, R. Die Tätigkeit der Niere. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 477-535 (1910). 187 footnotes.

NOLL, A. Die Sekretion der Drüsenzelle. II. Die Niere. *Ergeb. Physiol.* 6: 1-7 (1907). 176 references.

PINCUSOHN, LUDWIG. Chemie der Niere. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 470-476 (1910). 58 footnotes.

SIEBECK, RICHARD. Ueber die "osmotischen Eigenschaften" der Nieren. *Arch. ges. Physiol.* 148: 443-521 (1912). *Bibl. footnotes.*

KIESELGUHR. *See* DIATOMACEOUS EARTH.

KINETIC THEORY

KUENEN, J. P. Die Eigenschaften der Gase. Kinetische Theorie. Zustands-gleichung. Leipzig, Akad. Verlags., 1919. 548 p. *Bibl. footnotes.* Author index.

MELLOR, J. W. The kinetic theory of atoms and molecules. *In his* *Inorg. theor. chem.* 1: 740-876 (1922). About 115 references.

POLVANI, GIOVANNI. [Historical origin and fundamental concepts of the kinetic theory of gases.] *Nuovo cimento*, n. s., 1: 1-48 (1924). "Very comprehensive bibl."

See also GASES: PHYSICAL PROPERTIES.

KJELDAHL METHOD. *See* NITROGEN, DETERMINATION.

KOLA

"Kola." *Ind.-Cat. S. G. O.*, 1st ser., 7: 523 (1886); 2nd ser., 8: 815-816 (1903).

See also CAFFEINE.

KRYOFINE

"Kryofine." *Ind.-Cat. S. G. O.*, 2nd ser., 8: 868 (1903). 18 references.

KRYPTON

BRISCOE, H. VINCENT. Krypton. *In* Friend, *Textbook*, 1, pt. 2: 346-350 (1914). *Bibl. footnotes.*

See also RARE GASES.

KUMYSS

BRUSH, EDWARD E. Kumyss. New York, Styles and Cash, 190-. "Modern bibl.," p. 25-31.

"Kephir." *Ind.-Cat. S. G. O.*, 1st ser., 7: 375-376 (1886); 2nd ser., 8: 618-619 (1903).

"Koumiss." *Ind.-Cat. S. G. O.*, 1st ser., 7: 533-534 (1886); 2nd ser., 8: 835-836 (1903).

RUBINSKY, BENJAMIN. Studien ueber den Kumiss. *Centr. Bakt. Parasitenk.* (2) 28: 161-219 (1910). *Bibl. footnotes.*

STAHLBERG, EDUARD. Der Kumys, seine physiologischen und therapeutischen Wirkung. St. Petersburg, Marcks, 1869. 70 p. *Bibl.*, p. 69-70.

KYNURENIC ACID

DOHRN, M., and THIELE, A. Kynuren-säure. *In* Abderhalden, *Biochem. Handl.* 1: 1341-1343 (1911). 50 footnotes.

LABORATORIES

HAFERKORN, H. E. Reference list on laboratories arranged according to subjects. *Bull. Engineer School Library* 2, No. 8: 1-10 (1919).

WEST, CLARENCE J. Chemical and engineering laboratories. *J. Ind. Eng. Chem.* 12: 295-296 (1920); *Am. Architect* 117: 295-296 (1920). 62 references.

LABORATORY APPARATUS

BARLADEAN, A. G. [Cleaning and sterilizing of glass medicine containers and laboratory apparatus.] *Pharm. Zentralhalle* 56: 631-637 (1915).

See also CHEMICAL APPARATUS, PLATINUM.

LABRADORITE

DOELTER, C. Labradorit. *In his* *Handb. Mineralchem.* 2, pt. 3: 254-286 (1921). 185 analyses with references, also *bibl. footnotes.*

LACQUERS

MEHREN. Neuerungen auf dem Gebiete der Zelluloseesterlacke. *Kunststoffe* 12: 99-100 (1922). Patents.

SCHALL, M. Die Herstellung von Lacken aller Art ausschliesslich der Zelluloidlacke. *Kunststoffe* 1: 361-364, 391-393, 411-413 (1911); 6: 141-144 (1916). Patents.

SCHALL, M. Herstellung von Zelluloidlacken. *Kunststoffe* 1: 201-204 (1911); 6: 113-115 (1916). Patents.

SCHALL, M. [Manufacture of leather lacquers.] *Kunststoffe* 6: 157-159 (1916). Patents.

WORDEN, E. C. Cellulose nitrate lacquers, varnishes and bronzing liquids. *In his* *Technology of cellulose esters* 1: 2572-2599 (1921). *Bibl. footnotes.*

LACTASE

ZUNZ, EDGARD. Lactase. *In* Abderhalden, Biochem. Handl. 5: 546-548 (1911). 40 footnotes.

See also ENZYMES.

LACTIC ACID

CURRIE, JAMES N. Optical forms of lactic acid produced by pure cultures of *Bacillus bulgaricus*. *J. Biol. Chem.* 10: 201-211 (1911). 30 footnotes.

CZAPEK, F. Milchsäuregärung. *In* his *Biochemie der Pflanzen*, 3rd ed., 1: 338-347 (1922). Bibl. footnotes.

"Lactic acid." *Ind.-Cat. S. G. O.*, 1st ser., 1: 85-86 (1880); 2nd ser., 1: 114-115 (1896); 3rd ser., 1: 119-121 (1918).

MEYER-JACOBSON. α -Oxypropionsäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 555-568 (1913).

MEYERHOF, OTTO. Ueber die Rolle der Milchsäure in der Energetik des Muskels. *Naturwissenschaften* 8: 696-704 (1920). 19 references.

THIELE, A. Gewöhnliche Gärungsmilchsäure, α -Oxypropionsäure. *In* Abderhalden, Biochem. Handl. 1: 1057-1067 (1911). 250 footnotes (includes derivatives).

LACTIC ACID: Analytical.

CLAUSEN, S. W. Determination of small amounts of lactic acid. *J. Biol. Chem.* 52: 263-280 (1922). 35 references.

LACTOCHROME

PALMER, L. H., and COOLEGE, L. H. Lactochrome—the yellow pigment of milk whey. Its probable identity with urochrome, the specific yellow pigment of normal urine. *Missouri Agr. Expt. Sta., Research Bull. No.* 13: 453-487 (1914). 19 references.

See also CAROTINOIDS.

LACTONES

HJELT, EDV. Ueber die Laktone. *Sammlung chem. chem.-tech. Vorträge* 8: 84-146 (1903). Bibl. footnotes.

OTT, ERWIN. Neuere Untersuchungen ueber Laktone. 1907-1915. *Sammlung chem. chem.-tech. Vorträge* 26: 1-36 (1922). Bibl. footnotes.

LACTOSE

BELTZER, F. J. G. Industries du lactose et de la caséine végétale de "soja." Paris, Tignol, 1918. 144 p. Bibl.

"Lactose." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 164 (1904). 24 references.

LIPPMANN, E. O. v. Laktose. *In* his *Chemie des Zuckerarten*, 2: 1520-1584 (1895). Bibl. through text.

MEYER-JACOBSON. Milchsucker. *In* their *Lehrb. org. Chem.* 1, pt. 2: 1012-1016 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. Laktose. *In* Abderhalden, Biochem. Handl. 2: 417-427 (1911); 8: 221-226 (1914). Bibl. footnotes.

ZEMPLÉN, GÉZA. Laktose. *In* Abderhalden, Biochem. Handl. 10: 611-623 (1923). Bibl. footnotes.

See also CARBOHYDRATES.

LACTOSE: Analytical.

ADRIANO, F. T. Volumetric method for the determination of lactose by alkaline potassium permanganate. *Philipp. J. Sci.* 17: 213-220 (1920).

BLEYER, B., and STEINHAUSER, H. [Methods for the determination of lactose.] *Milchwirtschaft Forsh.* 1: 131-199 (1924).

LAKES

SCHALL, M. [Tabular review of the patents for the preparation of lake and color mordants.] *Kunststoffe* 6: 274-278, 293-296 (1916). Patents.

LAMP BLACK

McCLELLAND, E. H. Lamp black; a bibliography. *Carnegie Library of Pittsburgh, Mo. Bull.* 24: 194-199 (1919). 61 entries.

See also CARBON BLACK.

LANOLIN

BOUVET, M. Les emplois de la lanoline. *Bull. sci. pharmacol.* 25: 233-246 (1918). Bibl. footnotes.

LANOLIN. Zusammenstellung der in den Jahren 1885 bis 1894 ueber das Lanolin veröffentlichten Arbeiten aus den medizinischen Fachblättern des In- und Auslandes. 3rd ed. Berlin, 1895. 97 p.

See also FATS.

LANTHANUM

MAGEE, W. H. Indexes to the literature of cerium and lanthanum. *Smithsonian Misc. Coll. No.* 971, 1895. Lanthanum, p. 32-40. 180 references.

See also RARE EARTHS.

LARD

"Lard, adulteration of." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 216 (1904). 21 references.

See also FATS.

LATERITE

Luz, A. Laterit, seine Betrachtung im Lichte der Kolloidchemie. *Kolloid-Z.* 14: 81-90 (1914). 41 footnotes.

SWANSON, C. O. The origin, distribution and composition of laterite. *J. Am. Ceram. Soc.* 6: 1247-1260 (1923). Bibl. footnotes.

LAURIC ACID

SCHMIDT, E. Laurinsäure. *In* Abderhalden, Biochem. Handl. 1: 997-999 (1911). 55 footnotes (includes derivatives).

See also ACIDS, ORGANIC.

LEAD

- BERGEN, R. C. Lead. *Mineral Ind.* 26: 375-404 (1917). Bibl. footnotes.
- BENDER, C. H. Lead. *Mineral Ind.* 25: 437-475 (1916). Bibl. footnotes.
- BOUCHONNET, A. Bismuth, étain, plomb. Paris, Doin, 1920. Bibl., p. 353-365.
- BOUCHONNET, A. Industries du plomb et du mercure. Paris, Doin, 1909. 2 vols. Bibl., vol. 1: 281-287; vol. 2: 341-346.
- CAVEN, R. M. Lead. In *Friend, Text-book*, 5: 365-442 (1917). Bibl. footnotes.
- GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period (1913-1919). Lead. 1922. 95 p. Bibl., p. 84-95.
- HEAP, HARRI. The actions of various waters upon lead. *J. Soc. Chem. Ind.* 32: 854 (1913). 28 references. "Lead and compounds." *Ind.-Cat. S. G. O.*, 1st ser., 7: 895-897 (1886); 2nd ser., 9: 334 (1904).
- LEMOULT, —. Plomb. In *Moissan, Chim. min.* 4: 953-1058 (1905). 1251 footnotes.
- MATHERS, FRANK C. The electrodeposition of lead. *Trans. Am. Electrochem. Soc.* 23: 153-192 (1913). Extensive review of literature.
- PARENTIER, F. Plomb et ses composés. In *Frémy, Enc. chim.*, 3, 13^e cahier, pt. 2: 130-134 (1892).
- PENZER, N. M. Lead. In *his Non-ferrous metals and other minerals*, 1924, p. 234-237.
- PETERS, FRANZ, and SCHAAR-ROSENBERG, F. Blei. In *Gmelin-Kraut, Handb. anorg. Chem.*, 4, pt. 2: 1-180, 795-842 (1924). References through text.
- PICK, H., and AHRENS, —. Blei. In *Abegg, Handb. anorg. Chem.* 3, pt. 2: 759-776 (1909). 1005 references.
- PULSIFER, H. B. Lead. *Mineral Ind.* 28: 393-432 (1919); 29: 405-436 (1920); 30: 399-441 (1921); 31: 416-450 (1922). Bibl. footnotes.
- SMYTHE, J. A. Lead, its occurrence in nature, the modes of its extraction, its properties and uses with some account of its principal compounds. New York, Longmans, 1923. 343 p. Bibl. footnotes.
- THUM, ERNEST E. Lead. *Mineral Ind.* 27: 411-452 (1918). Bibl. footnotes.
- U. S. GEOLOGICAL SURVEY. Survey publications on lead and zinc. U. S. Geol. Sur., *Mineral Resources*, 1914, pt. 1: 916-919 (1916). 102 references.

LEAD: Alloys.

- PETERS, F., and SCHAAR-ROSENBERG, F. Lead alloys. In *Gmelin-Kraut, Handb. anorg. chem.* 4, pt. 2 (1924): Al, p. 600; Ba, p. 579; Bi, p. 714; Ca, p. 585; Cd, p. 736; Cr, p. 617; Li, p. 558; Mg, p. 595; Mn, p. 662; Mo, p. 647; Na, p. 560; Sb, p. 690; Si, p. 604; Sn, p. 742; Sr, p. 583; Te, p. 711; Tl, p. 789; W, p. 640; Zn, p. 726. References through text.

See also ALLOYS.

LEAD: Analytical.

- PETERS, F., and SCHAAR-ROSENBERG, F. Blei—Analytisches. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 164-180, 839-842 (1924). Classified.
- WOUDSTRA, H. W. Lood in drinkwater, zijne schadelijkheid en de methoden om het te bepalen. *Chem. Weekblad* 5: 185-204, 206-216 (1908). Bibl. footnotes.

LEAD: Metallurgy.

- COLLINS, HENRY F. The metallurgy of lead. London, Griffin, 1910. 538 p. Bibl. footnotes.
- HOFMAN, H. O. Metallurgy of lead. New York, McGraw, 1918. 664 p. Extensive bibl. footnotes.

LEAD: Radioactive.

- DAVIS, ARTHUR L. Atomic weight of lead from samarskite. *J. Phys. Chem.* 22: 639 (1918). 24 references.
- LUCAS, RICHARD. Radioaktives Blei. In *Gmelin-Kraut, Handb. anorg. Chem.* 3, pt. 2: 38-40 (1908).

LEAD BROMIDE

- PETERS, F., and SCHAAR-ROSENBERG, F. Bleibromide. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 366-373, 885-886 (1924).

LEAD CARBONATE

- LEITMEIER, H. Bleicarbonat. In *Doelter, Handb. Mineralchem.* 1: 509-516 (1912). Bibl. footnotes.
- PETERS, F., and SCHAAR-ROSENBERG, F. Bleicarbonat. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 429-462, 893-895 (1924).

LEAD CHLORIDE

- PETERS, F., and SCHAAR-ROSENBERG, F. Bleichloride. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 323-342, 879-882 (1924).

LEAD CHROMATE

- PETERS, F., and SCHAAR-ROSENBERG, F. Bleichromat. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 618-634 (1924).

LEAD IODIDE

- PETERS, F., and SCHAAR-ROSENBERG, F. Bleijodide. In *Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 2: 380-390, 888-889 (1924).

LEAD NITRATE

PETERS, F., and SCHAAR-ROSENBERG, F. Bleinitrate. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 2: 243-256, 864-868 (1924).

LEAD ORES

HALL, T. C. F. Lead ores. London, Murray, 1921. (Imperial Inst. Mon.) Bibl., p. 123-127. 82 references, 1864-1920.

LEAD OXIDES

PETERS, F., and SCHAAR-ROSENBERG, F. Blei und Sauerstoff. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 2: 181-238, 843-863 (1924).

LEAD POISONING

HAMILTON, ALICE. Lead poisoning in the smelting and refining of lead. Bur. Labor Statistics, Whole No. 141, 1914. 97 p.

"Lead pipes and water contamination." Ind.-Cat. S. G. O., 1st ser., 7: 897-898 (1886); 2nd ser., 9: 344-345 (1904).

"Lead poisoning." Ind.-Cat. S. G. O., 1st ser., 7: 898-907 (1886); 2nd ser., 9: 334-344 (1904).

TELEKY, L. German literature on the white lead question. J. Ind. Hyg. 4: 100-105 (1922).

See also POISONS, INDUSTRIAL.

LEAD SILICATES

SJÖGREN, H., et al. Bleisilicate. In Doelter, Handb. Mineralchem. 2, pt. 1: 793-806 (1914).

LEAD SULFATE

PETERS, F., and SCHAAR-ROSENBERG, F. Bleisulfate. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 2: 290-310, 871-877 (1924).

LEAD SULFIDE

PETERS, F., and SCHAAR-ROSENBERG, F. Bleisulfid. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 2: 275-288, 868-871 (1924).

WOELFEL, A., and CARLSON, A. J. Solubility of lead sulfide ores and of lead sulfide in human gastric juice. Bur. Labor Statistics, Whole No. 141, p. 82-84 (1914).

LEATHER

ALLEN, FREDERICK J. The shoe industry. New York, Holt, 1922. 415 p. "Shoe and leather bibl.," p. 397-400.

FAHRION, W. Ueber die Vorgänge bei der Lederbildung. Z. angew. Chem. 22: 2083, 2135, 2187 (1909). 70 footnotes.

JACKSON, D. D., and HOU, TE PANJ. The more important works in leather industry. J. Am. Leather Chem. Assoc. 16: 248-250 (1921). 34 books, 12 journals.

LAUFFMANN, R. [Progress in the leather industry.] Gerber 48: 59-60,

69, 99-101, 113-114, 120-122, 135-136, 143-145, 152-156, 161-163 (1922); 49: 65-66, 75-77, 81-82, 92, 101-103, 109-110 (1923); 50: 73, 82, 89, 105, 125, 133, 141, 149 (1924). Bibl. footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Leather and glue. In Annual reports of the progress of applied chemistry, 1: 226-242 (1916); 2: 353-374 (1917); 3: 321-341 (1918); 4: 347-364 (1919); 5: 351-369 (1920); 6: 379-402 (1921); 7: 334-358 (1922); 8: 383-406 (1923). Bibl. footnotes. Reprinted in J. Am. Leather Chem. Assoc. 12: 487-505 (1917); 14: 179-202 (1919); 15: 380-397 (1920); 18: 639-659 (1923). STIASNY, EDM. Fortschritte auf dem Gebiete der Lederindustrie. Chem.-Ztg. 31: 1179, 1196, 1206, 1217, 1241, 1270, 1281 (1907). 250 footnotes.

WILSON JOHN A. The chemistry of leather manufacture. New York, Chem. Cat. Co., 1923. 343 p. Bibl. footnotes.

WILSON, J. A. Preparation of skin for tanning. J. Ind. Eng. Chem. 14: 834-836 (1922). 30 footnotes.

WOOD, J. T. The bacteriology of the leather industry. J. Soc. Chem. Ind. 30: 267-268 (1910); J. Am. Leather Chem. Assoc. 6: 249-252 (1911). 57 references, with author index.

WOOD, JOSEPH T. The puering, bating and drenching of skins. New York, Spon, 1912. 300 p.

Serial

Journal of the American leather chemists' association. Easton. 1906-. Abstracts and patents (not classified) are published of the important work in leather chemistry.

Journal of the Society of Leather Trades Chemists. 1917-. (Formerly Collegium). Abstracts classified as follows: Leather manufacture, analysis, theory of tanning, organic, inorganic and physical, miscellaneous. Patents are included.

See also TANNING, WASTE.

LEATHER: Analytical.

VEITCH, F. P., and FREY, R. W. Review of analytical work applicable to leather and tanning. J. Ind. Eng. Chem. 14: 825-829 (1922). 87 references.

LEATHER: Artificial.

KAUSCH, OSCAR. Verfahren zur Herstellung von Kunstleder. Kunststoffe 1: 1-3, 25-28, 51-54 (1911); 4: 87-89 (1914). Patents.

MOCK, H., and BLUM, A. List of United States, British and German

- patents covering the manufacture of leather substitutes. New York, 1918. 51 p.
- SCHALL, M. [The manufacture of artificial pelts.] *Kunststoffe* 4: 263-266, 289-291 (1914). Patents.
- SCHALL, M. [Artificial leather from paper pulp.] *Kunststoffe* 4: 385 (1914). Patents.
- SCHALL, M. Die Herstellung von Kunstleder. *Kunststoffe* 9: 141, 159, 187, 201, 218, 281, 300 (1919). 265 patents.
- WORDEN, E. C. Artificial leather. *In his Technology of cellulose esters* 1: 2599-2610 (1921). Bibl. footnotes.
- LEAVES**
- BROWN, HORACE T., and MORRIS, G. HARRIS. The chemistry and physiology of foliage leaves. *J. Chem. Soc.* 63: 674-677 (1893). 63 references.
- SCHERTZ, FRANK M. Chemical and physical study of mottling of leaves. *Bot. Gaz.* 71: 128-130 (1921).
- LECITHIN**
- CZAPEK, F. Die pflanzlichen Lecithide (Phospholipoiden). *In his Biochemie der Pflanzen*, 3rd ed., 763-784 (1922). Bibl. footnotes.
- FORBES, E. G., and KEITH, M. HELEN. A review of the literature of phosphorus compounds in animal metabolism. *Ohio Agr. Expt. Sta., Tech. Series, Bull. No. 5*, 1914. 748 p. Bibl., p. 589-709. About 1900 references, covering chemistry and metabolism.
- KADE, F. Zur Synthese der Lecithine. Dissertation, Zürich, 1911.
- LANDSBERG, G. Das Lecithin, seine Rolle im Organismus und seine therapeutische Verwendung. *Zentr. ges. Physiol. Path. Stoffw.* 1: 193-212 (1906). 203 references.
- "Lecithin." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 354-355 (1904).
- MACLEAN, HUGH. Lecithin and allied substances. New York, Longmans, 1918. 206 p. Bibl., p. 181-202.
- MERCK, E. Lecithin. *In his Annual report of recent advances in pharmaceutical chemistry and therapeutics*, 26: 50-71 (1913).
- MEYER-JACOBSON. Lecithin. *In their Lehrb. org. Chem.* 1, pt. 2: 152-154 (1913).
- See also LIPIDS.
- LEGAL CHEMISTRY**
- DENNSTEDT, M. Ueber neuere Fortschritte auf dem Gebiete der forensischen Chemie. *Ber.* 44: 5-38 (1911). Bibl. footnotes.
- LEUCINE**
- MEYER-JACOBSON. Leucin. *In their Lehrb. org. Chem.* 1, pt. 2: 758-764 (1913). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Leucin. *In Abderhalden, Biochem. Handl.* 4: 543-562 (1911); 9: 103-105 (1915). Many bibl. footnotes.
- LEUCITE.** See POTASSIUM ALUMINIUM SILICATE.
- LEVoglucosan**
- ZEMPLÉN, GÉZA. Levoglucosan. *In Abderhalden, Biochem. Handl.* 10: 557-560 (1923). Bibl. footnotes.
- LEVULINIC ACID**
- MEYER-JACOBSON. Lävulinsäure. *In their Lehrb. org. Chem.* 1, pt. 2: 1161-1167 (1913). Bibl. footnotes.
- LEVULOSE.** See FRUCTOSE.
- LEVULOSURIA**
- ADLER, OSKAR. Die Lävulosurien. *Arch. ges. Physiol.* 139: 93-120 (1911). Bibl. footnotes.
- LICHENS**
- BRIEGER, WALTER. Synthetische Versuche auf dem Gebiete der Flechtenstoffe und ihre Bausteine. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 10: 205-438 (1921). Bibl. footnotes.
- HESSE, O. Die Flechtenstoffe. *In Abderhalden, Biochem. Handl.* 7: 32-144 (1912). About 450 footnotes.
- LIESEGANG PHENOMENON**
- HATSCHKE, E. The Liesegang phenomenon. *In Second report on colloid chemistry*, 1918, p. 25-26.
- LIGHT**
- BANCROFT, WILDER D. Chemical production of light. *J. Franklin Inst.* 175: 129-149 (1913). 43 footnotes.
- HARNED, HERBERT S. Radiation and chemical reactions. *J. Franklin Inst.* 196: 201-202 (1923). 39 references. See also BIOLUMINESCENCE, PHOTOCHEMISTRY, PHOTOSYNTHESIS.
- LIGHT: Absorption.**
- LIFSCHITZ, J. Die Änderungen der Lichtabsorption bei der Salzbildung organischer Säuren. *Sammlung chem. chem.-tech. Vorträge* 21: 288-289 (1914). 25 references.
- RUDOLF, GEORGE. Die Lichtabsorption in Lösungen vom Standpunkt der Dissociationstheorie. *Sammlung chem. chem.-tech. Vorträge* 9: 1-80 (1904). Bibl. footnotes.
- See also SPECTRA, ABSORPTION.
- LIGHT: Biological action.**
- BOVIE, W. T. The action of Schumann rays on living organisms. *Bot. Gaz.* 61: 27-29 (1916). 39 references.

LIGHT: Biological action—Cont'd

CLARK, JANE H. Physiological action of light. *Physiol. Rev.* 2: 277-309 (1922). 90 references.

HUYGE, C. Bibliographie concernant l'action abiotique des rayons ultraviolets. *Ann. Sta. Agron. Etat Gembloux* 1: 210-214 (1912).

MACDOUGAL, DANIEL T. The influence of light and darkness upon growth and development. *Mem. N. Y. Botanical Garden*, vol. 2, 1903. 319 p. About 200 footnotes.

PINCUSSEN, LUDWIG. Biologische Lichtwirkung, ihre physikalischen und chemischen Grundlagen. *Ergeb. Physiol.* 19: 80-94 (1921). 726 references.

See also PHOTOSYNTHESIS.

LIGHT: Chemical action. *See* PHOTO-CHEMISTRY.

LIGHT SCATTERING

MARTIN, WM. H. Light scattering; bibliography. *Trans. Royal Soc. Canada*, 3rd ser., 16: 275-281 (1923).

LIGNIN

CZAPEK, F. Verholzte Zellmembranen. *In his* *Biochemie der Pflanzen*, 3rd ed., 1: 682-694 (1922). Bibl. footnotes.

RIEFENSTAHL, RUD. Der gegenwärtige Stand der Ligninchemie. *Z. angew. Chem.* 37: 169-177 (1924). Bibl. footnotes.

ZEMPLÉN, GÉZA. Lignocellulose und Lignin (Holzsubstanz). *In* *Abderhalden, Biochem. Handl.* 2: 233-245 (1911); 8: 81-82 (1914); 10: 328-346 (1923). Bibl. footnotes.

See also COAL (Strache).

LIGNITE

GLENK, ROBERT. Louisiana lignite, its occurrence and utilization. *Louisiana Dept. Conservation, Bull.* No. 8, 1921. 65 p. Bibl., p. 64-65.

See also COAL, FUEL, BRIQUETTING.

LIGNUM VITAE

RECORD, SAMUEL J. Lignum vitae, a study of the wood of *Zygophyllaceae* with reference to the true lignum vitae of commerce, its sources, properties, uses and substitutes. *Yale Univ., School of Forestry, Bull.* No. 6, 1921. 48 p. Bibl., p. 45-48.

LIME AND LIMESTONE

BURCHARD, E. F. Lime. *U. S. Geol. Sur., Mineral Resources*, 1911, pt. 2: 717-718. 51 references.

NATIONAL LIME ASSOCIATION. Publications of the National Lime Association, construction, agricultural and chemical departments. *Washington, National Lime Assoc.*, 1922. 7 p.

OSTEN-SACKEN, O. B. Beiträge zur Kenntniss einiger vorwiegend aus zoogenen Komponenten auf gebauter Kalksteine. *Berlin*, 1914. 154 p. Bibl., p. 140-152. 405 references.

STONE, RALPH W. United States and State publications relating to limestone and lime. *U. S. Geol. Sur., Mineral Resources*, 1913, pt. 2: 322-324.

WEST, CLARENCE J. Bibliography on lime. *Special Libraries* 12: 71-87 (1921). About 600 references, 1900-1921.

LIME LIQUORS

BURTON, DONALD. The analysis of lime liquors. *J. Soc. Leather Trades Chem.* 4: 32-44 (1920); *J. Am. Leather Chem. Assoc.* 15: 309-310 (1920). 34 references.

LIMONENE

BARTELT, K. Limonen. *In* *Abderhalden, Biochem. Handl.* 7: 273-285 (1912). 125 footnotes.

See also ESSENTIAL OILS.

LIMONITE. *See* IRON ORES.

LINALOOL

BARTELT, K. Linalool. *In* *Abderhalden, Biochem. Handl.* 7: 371-375 (1912). 75 footnotes.

MEYER-JACOBSON. Linalool. *In their* *Lehrb. org. Chem.* 1, pt. 1: 925-926 (1907). 53 references.

LINOLEUM

FRTZ, FELIX. 60 Jahre Linoleumfabrikation. *Chem.-Ztg.* 47: 749, 771, 794, 812, 830, 870 (1923). 50 footnotes.

KAUSCH, OSCAR. Tabelle ueber die patentierten Verfahren und Vorrichtungen zur Herstellung von Linoleum. *Kunststoffe* 4: 145, 188, 229, 250 (1914). Patents.

SCHALL, M. Herstellung von Linoleum und Wachstum nach der Patentliteratur. *Kunststoffe* 7: 41-43 (1917). 20 patents.

LINSEED OIL

FAHRION, W. [Polymerization of linseed oil and wood oil.] *Chem. Umschau* 24: 102, 117, 144 (1917); 25: 14, 27, 39, 51, 63, 74, 87 (1918). Bibl. footnotes.

FRIEND, J. NEWTON. The chemistry of linseed oil. *New York, Van Nostrand*, 1917. 96 p. Bibl., p. 83-93.

UNRUH, A. v. Leinölersatzmittel. *Kunststoffe* 3: 1-4, 22-26 (1913). 61 references.

See also FATS.

LIPASE

CONNSTEIN, WILHELM. Ueber fermentative Fettsäurespaltung. *Ergeb. Phy-*

- siol. 3, pt. 1: 194-199 (1904). 151 references.
- HULL, MARY, and KEETON, ROBERT W. Existence of a gastric lipase. *J. Biol. Chem.* 32: 127 (1917). 25 references.
- "Lipase." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 570-571 (1904). 44 references.
- RICE, FRANK E., and MARKLEY, ALTON L. Proof of the presence of lipase in milk and a new method for the detection of the enzyme. *J. Dairy Science* 5: 64-82 (1922). 67 references.
- ZUNZ, EDGARD. Lipase. *In* Abderhalden, *Biochem. Handl.* 5: 572-578 (1911). 135 footnotes.
- See also ENZYMES; FATS, PHYSIOLOGICAL.
- LIPEMIA**
- ALLEN, FREDERICK M. Experimental studies on diabetes. Series IV. Lipemia. 2. The production of diabetic lipemia in animals and observations on some possible etiologic factors. *J. Metabolic Res.* 2: 244-298 (1922). 377 references, annotated.
- See also DIABETES.
- LIPIDS**
- BANG, IVAR. Biochemie der Zelllipide. *Ergeb. Physiol.* 6: 132-133 (1907); 8: 464-466 (1907). 200 references.
- BANG, IVAR. Chemie und Biochemie der Lipide. Wiesbaden, Bergmann, 1911. 187 p. Bibl. footnotes.
- BANG, IVAR, and FUCHS, D. Phosphatide. *In* Abderhalden, *Biochem. Handl.* 3: 225-249 (1911); 8: 461-468 (1914). About 225 footnotes.
- "Blood, fats and lipoids in." *Ind.-Cat. S. G. O.*, 3rd ser., 3: 73-74 (1922). 75 references.
- BLOOR, W. R. Distribution of the lipoids (fat) in human blood. *J. Biol. Chem.* 25: 577-599 (1916). 72 references.
- CZAPEK, F. Die Lipide in Stoffwechsel der Pflanze. *In* *his* Biochemie der Pflanzen, 3rd ed., 1: 709-820 (1922). Bibl. footnotes.
- FRANKEL, SIGMUND. Gehirn-Chemie. *Ergeb. Physiol.* 8: 212-213 (1907). 75 references.
- JARISCH, ADOLF. Beiträge zur Pharmakologie der Lipide. I. Versuche an roten Blutkörperchen. *Arch. ges. Physiol.* 186: 316-317 (1921). 40 references.
- JOBLING, JAS. W. Relation of lipoids to immune reactions. *J. Immunology* 1: 491-500 (1916). 67 references.
- LEVENE, P. A., and ROLF, IDA P. Structure and significance of the phosphatides. *Physiol. Rev.* 1: 363-393 (1921). Classified.
- SCHULZ, FR. N. Phosphatide und Sulfatide. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 1: 213-238 (1923). 125 footnotes.
- WINTERSTEIN, E. Darstellung von Phosphatiden aus Pflanzen. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 6: 129-144 (1922). Bibl. footnotes.
- See also CHOLESTEROL, LECITHIN, KEPHALIN, ETC.
- LIQUID AIR.** See AIR: LIQUID.
- LIQUID CRYSTALS**
- LEHMANN, O. Die Hauptsätze der Lehre von den flüssigen Kristallen. *Physik. Z.* 19: 73-80, 88-100 (1918). Bibl. footnotes.
- LEHMANN, OTTO. Die Lehre von den flüssigen Krystallen und ihre Beziehung zu den Problemen der Biologie. *Ergeb. Physiol.* 16: 256-509 (1918). Bibl. footnotes.
- LEHMANN, OTTO. Die neue Welt der flüssigen Krystalle und deren Bedeutung für Physik, Chemie, Technologie und Biologie. Leipzig, 1911. 388 p. Bibl. footnotes.
- LEHMANN, OTTO. Einfluss von Wirbelbewegung auf die Struktur flüssiger Kristalle. *Ann. Physik* 39: 80-110 (1912). Bibl. footnotes.
- LEHMANN, OTTO. Flüssige Krystalle und Kolloide. *Kolloid-Z.* 15: 65-75 (1914). 72 footnotes.
- LEHMANN, OTTO. Flüssige Krystalle und die Theorien des Lebens. 2nd ed. Leipzig, Barth, 1908. Bibl. footnotes.
- LEHMANN, OTTO. Methoden zur Darstellung und Untersuchungen flüssiger Kristalle. *In* Abderhalden, *Handb. biol. Arbeitsm.* 3A: 123-352 (1922). Bibl. footnotes.
- LINGEN, J. S. Anisotropic liquids. *J. Franklin Inst.* 191: 674-677 (1921). 52 references.
- ROTARSKI, TH. Molekular-mechanische Theorie der anistropen Flüssigkeiten oder der sogenannten flüssigen Kristalle. *J. prakt. Chem.* 190: 23-37 (1910). Bibl. footnotes.
- SCHENCK, RUDOLF. Kristallinische Flüssigkeiten und flüssige Kristalle. Leipzig, 1905.
- SCHENCK, RUDOLF. Bericht ueber die neueren Untersuchungen der kristallinischen Flüssigkeiten. *Jahrb. Radioakt. Elektronik* 6: 572-578 (1909). 120 references.
- STUMPF, FELIX. Doppelbrechung und optische aktivität flüssigkristallinischer Substanzen. *Jahrb. Radioakt. Elektronik* 15: 1-5 (1918). 75 titles, supplementing Schenck's bibl.

LIQUID CRYSTALS—Cont'd

VORLANDER, D. Kristallinsch-flüssige Substanzen. Sammlung chem. chem.-tech. Vorträge 12: 398-402 (1908).

LIQUIDS

MATHEWS, J. H., and COOKE, R. D. All properties of liquid mixtures. *J. Phys. Chem.* 18: 575-585 (1914). 193 references.

MELLOR, J. W. The kinetic theory of liquids. *In his Inorg. theor. chem.* 1: 840-848 (1922). 50 references.

LIQUORS: Fermented.

ENGELHARDT, F. E. Literature of wines, liquors and malt liquors. *In* N. Y. State Board of Health, 2nd Ann. Rept., 1882, p. 628-686. About 350 references.

See also BREWING, FERMENTATION, WINES.

LITHIUM

AUERBACH, FR., and BRISLEE, J. F. Lithium. *In* Abegg, Handb. anorg. Chem. 1, pt. 1: 151-154 (1907). 160 references.

EPHRAIM, FRITZ. Lithium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 234-272 (1906). References through text.

FORCRAND, R. DE. Lithium. *In* Frémy, Enc. chim. 3, 3^e cahier: 59-63 (1884).

LEBEAU, P. Lithium. *In* Moissan, Chim. min. 3: 454-488 (1904). 328 footnotes.

"Lithium and its salts." *Ind.-Cat. S. G. O.*, 1st ser., 8: 171 (1887); 2nd ser., 9: 582-583 (1904). 37 references.

WALKER, A. J. Lithium. *In* Friend, Textbook, 2: 52-80 (1924). Bibl. footnotes.

See also ALKALI METALS (Mellor).

LITHOPONE

MAAS, E., and KEMPF, R. Zur Kenntniss der Lithopone. *Z. angew. Chem.* 36: 293-297 (1923). 51 footnotes.

O'BRIEN, W. J. A study of lithopone. *J. Phys. Chem.* 19: 113-144 (1915).

LIVER

BAUMAN, LOUIS. The physiological and pathological chemistry of the liver. *In* Barker, Endocrinology and metabolism, 4: 643-655; references, 5: 511-694 (1922).

HOOPER, CHARLES W. The internal secretions of the liver and its disorders. *In* Barker, Endocrinology and metabolism, 2: 673-687; references, 5: 303-311 (1922).

WEINLAND, E. Die Physiologie der Leber. *In* Nagel, Handb. der Physiologie des Menschen 2: 425-515 (1907). Bibl. footnotes.

WOHLGEMUTH, JULIUS. Leber und Galle. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 150-223 (1910). 315 footnotes.

WOHLGEMUTH, JULIUS. Chemie der Leber. *In* Oppenheimer, Handb. Biochem., 2nd ed., 4: 595-602 (1924). 66 footnotes.

WOHLGEMUTH, JULIUS. Die Leber als sekretorisches Organ. *In* Oppenheimer, Hand. Biochem., 2nd ed., 4: 603-630 (1924). 154 footnotes.

LOGANBERRY

DAUGHTERS, MILO R. A chemical examination of the loganberry. *Oregon Agr. Expt. Sta., Bull. No. 151*, 1918, 10 p. Bibl., p. 9-10.

LORETIN

"Loretin." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 749 (1904). 15 references.

LOW TEMPERATURE DISTILLATION. See COAL.**LUBRICATING OILS**

DUNSTAN, A. E., and THOLE, F. B. Relation between viscosity and the chemical constitution of lubricating oils. *J. Inst. Petroleum Tech.* 4: 191-216 (1918); *Petrol. Rev.* 38: 245-246, 267-268 (1918). 40 references.

GARNER, F. H. Carbonization of lubricating oils in internal-combustion engines. *J. Inst. Petroleum Tech.* 7: 139-148 (1921). 150 references.

HERSCHEL, WINSLOW H. Testing the quality of lubricating oils. *Proc. Eng. Soc. Western Pa.*, 38: 539-541 (1923). 23 references.

HERSEY, MAYO D. Problems in lubrication research. *J. Am. Soc. Naval Engrs.* 35: 673-678 (1923). 30 references.

ROBERTSHAW, G. Methods of examining lubricating oils. *J. Inst. Petroleum Tech.* 6: 354-364 (1920). 193 references. Classified by methods.

WATERS, C. E. The action of sunlight and air upon some lubricating oils. *Bull. U. S. Bur. Standards* 7: 227-234 (1918); *Sci. Paper No. 153*. 20 references.

See also PETROLEUM.

LUMINAL. See SEDATIVES.**LUMINESCENCE**

BAERVOLD, H. Bericht ueber Lumineszenzerregung durch Kanalstrahlen. *Jahrb. Radioakt. Elektronik* 16: 65-67 (1919-1920). 27 references, 1886-1917. Bibl. footnotes.

BECKER, J. A. Bibliography of luminescence. *Bull. Nat. Research Council* 5, pt. 5: 80-126 (1923). 46 books and 1329 journal references, covering 1906-1922.

- MERRITT, ERNEST. Luminescence. *Phys. Rev.* (2) 5: 319-334 (1915). *Bibl. footnotes.*
- TRAUTZ, M. Bericht ueber die Lumineszenz bei chemischen Vorgängen. *Jahrb. Radioakt. Elektronik* 4: 136-138 (1907). 68 references.
- TRAUTZ, MAX. Studien ueber Chemilumineszenz. *Z. physik. Chem.* 53: 1-111 (1905). 100 footnotes.
- ZOCHER, H., and KANTSKY, H. Ueber Luminescence bei chemische Reaktionen. *Naturwissenschaften* 11: 198 (1923).
- See also* ELECTRONICS, FLUORESCENCE, PHOSPHORESCENCE.
- LUOINUS**
- "Alkaloids of luoinus." *Ind.-Cat. S. G. O.*, 1st ser., 8: 432 (1887); 2nd ser., 9: 827-828 (1904). 20 references.
- See also* ALKALOIDS.
- LUMBER**
- BRYANT, R. C. Lumber, its manufacture and distribution. New York, Wiley, 1922. 539 p. *Bibl.*, p. 439-448. 180 references.
- KELLOGG, ROYAL S., and SMITH, F. H. Lumber and its uses. 3rd ed. New York, U. P. C. Book Co., 1924. 370 p. "Forest Service Pub.," p. 360-365. "Pub. of N. L. M. A.," p. 365-366.
- See also* WOOD.
- LUNGS**
- PINCUSOHN, LUDWIG. Chemie der Lunge. *In* Oppenheimer, *Handb. Biochem.* 2, pt. 2: 369-376 (1909). 38 footnotes. 2nd ed., 4: 288-296 (1923). 47 footnotes.
- LUTECIUM.** *See* RARE EARTHS.
- LYMPH**
- ASHER, LEON. Die Bildung der Lymph. *Biochem. Centr.* 4: 1-8, 45-52 (1905). 107 references.
- ELLINGER, ALEX. Die Bildung der Lymph. *Ergeb. Physiol.* 1: 355-361 (1902). 174 references.
- GERHARTZ, HEINRICH. Chemie der Lymph. *In* Oppenheimer, *Handb. Biochem.* 2, pt. 2: 116-136 (1909). 96 footnotes.
- MAGNUS, R. Bildung der Lymph. *In* Oppenheimer, *Handb. Biochem.* 2, pt. 2: 99-115 (1909). 72 footnotes.
- LYSINE**
- "Lysine." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 87 (1904). 10 references.
- MEYER-JACOBSON, Lysin. *In their Lehrb. org. Chem.* 1, pt. 2: 771-773 (1913). *Bibl. footnotes.*
- WINTERSTEIN, E., and TRIER, G. Lysin. *In* Abderhalden, *Biochem. Handl.* 4: 637-644 (1911); 9: 127-128 (1915). About 180 footnotes (includes derivatives).
- See also* AMINO ACIDS.
- LYSOFORM**
- GEISENDÖRFER, GEORG. Untersuchungen über Lysoform. Dissertation, Bern, 1903. 52 p. *Bibl.*, p. 52.
- "Lysoform." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 871 (1905). 15 references.
- LYSOL**
- "Lysol." *Ind.-Cat. S. G. O.*, 2nd ser., 9: 871-872 (1904).
- See also* DISINFECTANTS.
- LYXOSE**
- ZÉMLÉN, GÉZA. Lyxose. *In* Abderhalden, *Biochem. Handl.* 10: 386-387 (1923). *Bibl. footnotes.*
- See also* CARBOHYDRATES.
- MAGNESIA CEMENTS.** *See* CEMENTS.
- MAGNESIUM**
- AMERICAN MAGNESIUM CORPORATION. Magnesium; a handbook of information and data relating to the use of magnesium alloys as they are made by the American magnesium corp'n. Niagara Falls, Am. Magnesium Corp'n., 1923. 177 p. *Bibl.*, p. 167-170. 81 references.
- DAWSON, H. M. Magnesium. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 2: 76-79 (1905). 158 references, 1820-1904.
- EPHRAIM, FRITZ. Magnesium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 2, pt. 2: 363-514 (1909). References through text.
- GEUTHER, TH. Magnesiumverbindungen. *In* Bräuer and d'Ans, *Fortschritte* 1: 3204-3206 (1923). German patents.
- "Magnesium and its salts." *Ind.-Cat. S. G. O.*, 1st ser., 8: 512-513 (1887); 2nd ser., 10: 50 (1905).
- MASSAL, G. Magnésium. *In* Moissan, *Chim. min.* 3: 906-985 (1904). 759 footnotes.
- MELLOR, J. W. Magnesium. *In his* *Inorg. theor. Chem.* 4: 249-397 (1923). *Bibl. through chapter.*
- PETERS, FRANZ. Forschungen und Fortschritte auf dem Gebiete der Elektrometallurgie des Magnesiums. 1908-1915. Glückauf 52: 141-147 (1916). *Bibl. footnotes.*
- MAGNESIUM: Organic compounds.** *See* GRIGNARD REACTION.
- MAGNESIUM ALUMINIUM SILICATE**
- DOELTER, C. Magnesium-Aluminium-silicate. *In* Doelter, *Handb. Mineralchem.* 2, pt. 2: 602-635 (1917). *Bibl. footnotes.*
- JACOBY, R. Magnesiumaluminiumsilicate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 302-308 (1912). References through text.

MAGNESIUM BORATE

EPHRAIM, FRITZ. Magnesiumborat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 452-458 (1909).

MAGNESIUM BROMIDE

EPHRAIM, FRITZ. Magnesiumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 428-431 (1909).

MELLOR, J. W. Magnesium bromide. *In his* Inorg. theor. chem. 4: 315-316 (1923). About 50 references.

MAGNESIUM CARBONATE

DOLBEAR, SAMUEL H. Magnesite. Mineral Ind. 25: 476-484 (1916); 26: 405-414 (1917); 27: 453-458 (1918); 28: 433-441 (1919); 29: 437-442 (1920); 30: 442-448 (1920). 82 references.

EPHRAIM, FRITZ. Magnesiumkarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 459-470 (1909).

GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Magnesite. 1920. 42 p. Bibl., p. 39-41.

KRAFT, PHILIP. Ueber die genetischen Beziehungen des dichten Magnesits zu den Mineralien der Nickelsilikatgruppe. Arch. Lagerstättenforschung, 1915, No. 20. 115 p. Bibl., p. 109-115. 179 references.

LEITMEIER, H. Magnesiumcarbonat. Magnesit. *In* Doelter, Handb. Mineralchem. 1: 220-243 (1912). Bibl. footnotes.

LEITMEIER, H., and d'ACHIARDI, G. Die Hydrate des Magnesiumcarbonats. *In* Doelter, Handb. Mineralchem. 1: 261-272 (1912). Bibl. footnotes.

MELLOR, J. W. Magnesium carbonate. *In his* Inorg. theor. chem. 4: 353-354, 357-358, 366-367, 376-378 (1923). About 600 references.

REDLICH, K. A. Entstehung und Vorkommen des Magnesits. Verwertung des Magnesits. *In* Doelter, Handb. Mineralchem. 1: 243-261 (1912). Bibl. footnotes.

REDLICH, KARL A. Die Bildung des Magnesits und sein natürliches Vorkommen. Fortschr. Mineral. Krist. Petr. 4: 9-42 (1914). 54 references.

U. S. TARIFF COMMISSION. Magnesite. *In its* Tariff information survey No. 20, 1920. Bibl., p. 118-119. 22 references.

WHITEWELL, G. E., and PATTY, E. N. Magnesite deposits of Washington. Wash. Geol. Sur., Bull. No. 25, 1921. Bibl., p. 180-189. 160 references. 1882-1920.

YALE, C. G., and GALE, H. S. Magnesite. U. S. Geol. Sur., Mineral Resources, 1914, pt. 2: 585-586.

MAGNESIUM CHLORIDE

EPHRAIM, FRITZ. Magnesiumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 419-428 (1909). References through text.

MELLOR, J. W. Magnesium chloride. *In his* Inorg. theor. chem. 4: 310-312 (1923). About 250 references.

MAGNESIUM HYDROXIDE

EPHRAIM, FRITZ. Magnesiumhydroxid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 389-391 (1909).

See also MAGNESIUM OXIDE.

MAGNESIUM NITRATE

EPHRAIM, FRITZ. Magnesiumnitrat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 394-398 (1909).

MAGNESIUM OXIDE

EPHRAIM, FRITZ. Magnesium und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 386-389 (1909).

MELLOR, J. W. Magnesium oxides and hydroxide. *In his* Inorg. theor. chem. 4: 293-296 (1923). About 400 references.

MAGNESIUM PHOSPHATE

EPHRAIM, FRITZ. Magnesium, Phosphor und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 435-445 (1909).

MELLOR, J. W. Magnesium orthophosphates. *In his* Inorg. theor. chem. 4: 388-389 (1923). About 125 references.

MAGNESIUM SILICATES

DOELTER, C. Olivinegruppe. *In his* Handb. Mineralchem. 2, pt. 1: 294-313 (1914). Bibl. footnotes.

DOELTER, C. Magnesiummetasilicate. *In his* Handb. Mineralchem. 2, pt. 1: 324-356 (1914). Bibl. footnotes.

DOELTER, C., et al. Magnesium hydro-silicate. *In his* Handb. Mineralchem. 2, pt. 1: 356-445 (1914). Bibl. footnotes.

JACOBY, R. Magnesiumsilikat. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 255-257 (1912).

SJÖGREN, HJ. Fluorhaltige Magnesiumsilicate. *In* Doelter, Handb. Mineralchem. 2, pt. 1: 313-323 (1914). Bibl. footnotes.

MAGNESIUM SULFATE

DINER, JACOB. Magnesium sulfate. J. Am. Pharm. Assoc. 17: 150-159 (1918). 51 references to pharmacological uses.

EPHRAIM, FRITZ. Magnesiumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 401-413 (1909).

MELLOR, J. W. Magnesium sulfate. *In his* Inorg. theor. chem. 4: 332-335 (1923). About 400 references.

MELLOR, J. W. The complex and double salts of magnesium sulfate. *In*

- his Inorg. theor. chem. 4: 347-349 (1923). About 200 references.
- MAGNETITE.** See IRON ORES.
- MAGNETOCHEMISTRY**
- WEDEKIND, E. Magnetochemie. Beziehungen zwischen magnetischen Eigenschaften und chemischer Natur. Berlin, Borntraeger, 1911. 114 p. Bibl. footnotes.
- WEDEKIND, E. Magnetochemie. Fortschritte Chem. 9: 287-299 (1914). References through text.
- MAIZE.** See CORN.
- MALACHITE.** See COPPER CARBONATE.
- MALIC ACID**
- MEYER-JACOBSON. Aepfelsäure. In their Lehrb. org. Chem. 1, pt. 2: 644-657 (1913). Bibl. footnotes.
- THIELE, A. l-Aepfelsäure. In Abderhalden, Biochem. Handl. 1: 1149-1154 (1911). 115 references.
- MALNUTRITION.** See NUTRITION.
- MALONIC ACID**
- MEYER-JACOBSON. Malonsäure. In their Lehrb. org. Chem. 1, pt. 2: 327-346 (1913). Bibl. footnotes.
- THIELE, ALBRECHT. Malonsäure. In Abderhalden, Biochem. Handl. 1: 1124-1127 (1911). 55 footnotes.
- MALT**
- "Malt and malt extract." Ind.-Cat. S. G. O., 1st ser., 8: 558-559 (1887); 2nd ser., 10: 80-81 (1905).
See also BREWING.
- MALTASE**
- ZUNZ, EDGARD. Maltase. In Abderhalden, Biochem. Handl. 5: 544-545 (1911). 50 footnotes.
See also ENZYMES.
- MALTOSE**
- LIPPMANN, E. O. v. Maltose. In his Chemie der Zuckerarten 2: 1439-1505 (1895). Bibl. through text.
- "Maltose." Ind.-Cat. S. G. O., 2nd ser., 10: 82-83 (1905). 17 references.
- NEUBERG, C., and REWALD, B. Maltose. In Abderhalden, Biochem. Handl. 2: 407-411 (1911); 8: 216-221 (1914). About 200 footnotes.
- ZEMPLÉN, GÉZA. Maltose. In Abderhalden, Biochem. Handl. 10: 600-608 (1923). 80 footnotes.
See also CARBOHYDRATES.
- MANDELIC ACID**
- DOHRN, M., and THIELE, A. Mandelsäure. In Abderhalden, Biochem. Handl. 1: 1287-1289 (1911). Bibl. footnotes.
- MANGANESE**
- BOLTON, HENRY C. Index to the literature of manganese, 1596-1874. Salem, Salem Press, 1876. 44 p. Reprinted from Annals of the Lyceum Nat. Hist., N. Y., 11: 208-249 (1875). Chronological.
- BUTTS, ALLISON. Manganese. Mineral Ind. 25: 485-499 (1916); 26: 415-445 (1917); 27: 459-482 (1918). 70 references.
- EPHRAIM, FRITZ. Mangan. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 217-410 (1908). References through text.
- GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Manganese. (1913-1919.) 1921. 151 p. Bibl., p. 132-140.
- LOTTERMOSER, A. Kolloidchemie des Mangans. In Abegg, Handb. anorg. Chem. 4, pt. 2: 895 (1912). 12 references.
- MARTIN, G., and DANCASTER, E. A. Manganese. In Friedl, Textbook, 3: 256-321 (1915). Bibl. footnotes.
- MIOLATI, A. Mangan. In Abegg, Handb. anorg. Chem. 4, pt. 2: 861-889 (1912). 1497 references.
- MOISSAN, H. Le manganèse et ses composés. In Frémy, Enc. chim. 3, 10^e cahier: 209-228 (1886). Chronological and by author.
- PENZER, N. M. Manganese. In his Nonferrous metals and other minerals, 1924. Bibl., p. 237-238.
- THOMAS, V. Manganèse. In Moissan, Chim. min. 4: 487-594 (1906). 1568 footnotes.
- WELD, C. M., and others. Manganese: uses, preparation, mining costs and the production of ferro-alloys. U. S. Bur. Mines, Bull. No. 173, 1920. 209 p. Selected bibl., p. 200-201. 20 references. Also bibl. footnotes.
- WHEELER, HAROLD L. A bibliography on the occurrence, geology and mining of manganese, with some references on its metallurgy and uses. Colorado Geol. Sur., Bull. No. 15, 1919. Bibl., p. 54-69. Revised and extended in Econ. Geol. 14: 245-261 (1919). 240 references. Classified.
- MANGANESE: Analytical.**
- CUNNINGHAM, T. R., and COLTMAN, R. W. The determination of manganese. I. A study of the bismuthate method. Ind. Eng. Chem. 16: 63 (1924). 21 references.
- EPHRAIM, FRITZ. Nachweis, Bestimmung und Trennung des Mangans. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 230-232 (1908).
- ÖSCH, JOSEPH. Kritische Studien über Mangan. Dissertation, Zürich, 1907. 124 p. Bibl., p. 117-124. 100 references.
- SERNAGIOTTO, EMILIO. Esame comparativo dei metodi analitici alle leghe metallische. Giorn. chem. ind. appl. 3: 148-152 (1921). 25 footnotes.

MANGANESE: Analytical—Cont'd

TALBOT, H. P., and BROWN, J. W. A bibliography of the analytical chemistry of manganese, 1785-1900. Smithsonian Inst. Misc. Coll., Pub. No. 1313, 1902. 124 p. 700-800 references; chronological.

WILLARD, H. H., and GREATHOUSE, L. H. A complete bibliography of the colorimetric determination of manganese. J. Am. Chem. Soc. 39: 2376-2377 (1917). 34 references.

MANGANESE: Ores.

CLEVENGER, GALEN H., and CORNEJO, A. Abstracts from the literature on treatment of manganese silver ores. U. S. Bur. Mines, Repts. of Investigations, No. 2458 (1923). 14 p. 37 references, annotated.

CURTIS, A. H. Manganese ores. London, Murray, 1919. 118 p. (Imperial Inst. Mon.) Bibl., p. 112-118. 159 references.

FREMOR, L. L. The manganese deposits of India. India Geol. Sur., Mem. No. 37, 1909. 1274 p. Bibl., p. 1161-1171. 263 references. "List of literature on foreign manganese ore deposits," p. 12-16.

HARDER, E. C. Manganese deposits of the United States with sections on foreign deposits. Chemistry and uses. U. S. Geol. Sur., Bull. No. 427, 1910. 298 p. Bibl., p. 284-288. 158 references.

HEWETT, D. F. Manganese and magniferous ores. U. S. Geol. Sur., Mineral Resources 1916, pt. 1: 752-756. 86 references. *Ibid.* 1917, pt. 1: 691-696. 120 references.

JENISON, H. A. C. Manganese and magniferous ores in 1919. U. S. Geol. Sur., Mineral Resources 1919, pt. 1: 141-148.

MISER, HUGH D. A list of papers treating of the manganese deposits of west-central Arkansas and the adjoining part of Oklahoma. U. S. Geol. Sur., Bull. No. 660-C, p. 60-61. 1917.

MANGANESE CARBONATE

EPHRAIM, F. Manganokarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 327 (1908).

LEITMEIER, H. Mangancarbonat (MnCO_3). *In* Doelter, Handb. Mineralchem. 1: 411-418 (1912). Bibl. footnotes.

MANGANESE CHLORIDES

EPHRAIM, F. Mangan und Chlor. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 298-305 (1908).

MANGANESE OXIDES

EPHRAIM, FRITZ. Mangan und Sauerstoff. *In* Gmelin-Kraut, Handb.

anorg. Chem. 3, pt. 2: 233-261 (1908).

SALINGER, MAX. Zur Kenntniss des Manganits. Z. anorg. Chem. 33: 322-354 (1903). 50 footnotes.

MANGANESE SILICATES

DOELTER, C. Mangan- und Eisenoxydsilicate. *In* his Handb. Mineralchem. 2, pt. 1: 711-722 (1914). Bibl. footnotes.

EPHRAIM, F. Mangansilikate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 389-392 (1908).

MANGANESE STEEL. See STEEL.**MANGANESE SULFATES**

EPHRAIM, F. Mangano- und Mangansulfate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 280-288 (1908).

MANGANESE SULFIDES

EPHRAIM, F. Mangan und Schwefel. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 273-280 (1908).

MECKWITZ, ALEX., and LANDESEN, GEORG. Zur Kenntniss der Bildung der grünen Manganosulfide. Z. anorg. allgem. Chem. 131: 101-118 (1923). Bibl. footnotes, supplementing Gmelin-Kraut.

MANNA

"Manna." Ind.-Cat. S. G. O., 1st ser., 8: 582 (1887); 2nd ser., 10: 11 (1905). 26 references.

MANNITOL

MEYER-JACOBSON. Mannit. *In* their Lehrb. org. Chem. 1, pt. 2: 183-187 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. *d*-Mannit. *In* Abderhalden, Biochem. Handl. 2: 451-456 (1911); 8: 238-242 (1914). About 160 footnotes.

ZEMPLÉN, GÉZA. Mannit. *In* Abderhalden, Biochem. Handl. 10: 667-677 (1923). Bibl. footnotes.

MANNOSE

LIPPMANN, E. O. v. *d*-Mannose. *In* his Chemie der Zuckerarten, 1: 639-666 (1895). Bibl. through text.

NEUBERG, C., and REWALD, B. *d*-Mannose. *In* Abderhalden, Biochem. Handl. 2: 341-345 (1911); 8: 173-175 (1914). About 125 footnotes.

ZEMPLÉN, GÉZA. Mannose. *In* Abderhalden, Biochem. Handl. 10: 517-521 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Mannose. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 5: 938-939 (1922). Bibl. footnotes.

MAPLE PRODUCTS

BRYAN, A. H. Maple sap sirup: its manufacture, composition and effect of environment thereupon. U. S. Dept. Agr., Bur. Chem., Bull. No. 134, 1910. 110 p. Bibl., p. 104-110.

SY, ALBERT P. History, manufacture and analysis of maple products. *J. Franklin Inst.* 166: 249-280, 321-352, 433-445 (1908). Bibl. footnotes.

MARBLE

DALE, T. N. The commercial marbles of western Vermont. *U. S. Geol. Sur., Bull.* No. 521, 1912. 170 p. Bibl., p. 55-60. 139 references. Vermont, State Geol. Rept., No. 9, 1914-1915, p. 48-54. 148 references.

PROUTY, W. F. Preliminary report on the crystalline and other marbles of Alabama. *Ala. Geol. Sur., Bull.* No. 18, 1916. 212 p. Bibl., p. 120-122. 37 references.

MARGARINE

CLAYTON, WM. Emulsion problems in margarine manufacture. *Trans. Faraday Soc.* 16, Appendix: 22-26 (1921). 16 references.

CLAYTON, WM. Margarine. New York, Longmans, 1920. 187 p. Bibl., p. 144-179.

HALLIBURTON, W. D., and DRUMMOND, J. C. The nutritive value of margarine and butter substitutes with reference to their content of the fat soluble accessory growth substances. *J. Physiol.* 51: 235-251 (1917). 31 references.

"Margarine." *Ind.-Cat. S. G. O.*, 2nd ser., 10: 133 (1905). 23 references.

"Oleomargarin." *Ind.-Cat. S. G. O.*, 1st ser., 10: 127-128 (1889); 2nd ser., 12: 146-147 (1907).

See also BUTTER, DAIRY PRODUCTS.

MARINE INVERTEBRATES

CLARKE, FRANK W., and WHEELER, WALTER C. The inorganic constituents of marine invertebrates. *U. S. Geol. Sur., Prof. Paper* No. 124, 1922. 62 p. 80 footnotes.

MARINE PRODUCTS

TRESSLER, DONALD K. Marine products of commerce. New York, Chem. Cat. Co., 1923. 762 p. Bibl. through text.

MARL

PARSONS, A. L. Greensand marl. *U. S. Geol. Sur., Mineral Resources*, 1901: 823-827. 11 references.

MATCHES

"Matches and match manufacture." *Ind.-Cat. S. G. O.*, 1st ser., 8: 680-681 (1887); 2nd ser., 10: 229 (1905).

MATE

HERRERO DUCLOUX, ENRIQUE and LEOPOLDO. Datos analiticos de la yerbe mate y sus falsificaciones. *In* De la Revista del Museo de La Plata, 23: 126-131 (1915).

"Mate." *Ind.-Cat. S. G. O.*, 1st ser., 8: 681 (1887); 2nd ser., 10: 229 (1905). 29 references.

See also FOODS (Vereinbarungen).

MATERIALS: Testing.

BATSON, R. G. Testing of materials. *Intern. Eng. Congr.*, 1915, paper 113, p. 598-622. Bibl. on impact testing and brittleness, 200 references. Hardness and abrasion testing, 215 references.

Index of publications concerning testing materials. *Proc. Intern. Assoc. Testing Materials* 2, pt. 1: 69-216, 285-384 (1910-1913). Covers 1908-1910.

MEAT PRODUCTS

Chemical technology of the frozen meat industry. New Zealand *J. Sci. Tech.* 4: 97-107, 155-164 (1921). 57 references.

"Meat and meat extracts." *Ind.-Cat. S. G. O.*, 1st ser., 8: 757-764 (1887); 2nd ser., 10: 311-326 (1905). Includes inspection, hygiene, care, poisoning, preservation.

OSTERTAG, ROBERT. Konservierung des Fleisches. *In* his *Bibliographie des Fleischbeschau*, 1905, p. 319-336, 431-438.

SCHENKE, V. [Meat meal made from diseased animals.] *Landw. Vers. Stat.* 58: 36-54 (1903).

SPIECKER, —. [Meat poisoning and its relation to diseases of men and of animals.] *Hyg. Rundschau* 29: 113-124 (1919). 150 references.

STREET, JOHN P. Meat extracts and meat preparations. *Conn. Agr. State Sta. Rept.*, 1907-1908, pt. 9: 664-672. About 200 references.

WRIGHT, A. M. Chemical and bacteriological study of fresh and frozen New Zealand lamb and mutton. *J. Soc. Chem. Ind.* 31: 965 (1912). 28 references.

MECONIUM

"Meconium." *Ind.-Cat. S. G. O.*, 1st ser., 8: 768 (1887); 2nd ser., 10: 329 (1905). 29 references.

See also ALKALOIDS.

MEDICINES. See PHARMACEUTICALS.

MEERSCHAUM

DOELTER, C. Meerschaum (Sepiolith). *In* his *Handb. Mineralchem.* 2, pt. 1: 374-383 (1914). Bibl. footnotes.

See also MAGNESIUM SILICATE.

MELANIN

FÜRTH, O. v. Melanine und sonstige Farbstoffe. *In* Oppenheimer, *Handb. Biochem.* 1: 743-756 (1909). 52 footnotes.

GORTNER, ROSS A. Melanin. *Biochem. Bull.* 1: 207-215 (1911). 15 references.

GORTNER, R. A. Studies on melanin. *J. Am. Chem. Soc.* 35: 1262-1268 (1913). 12 references.

MELANIN—Cont'd

"Melanin." *Ind.-Cat. S. G. O.*, 1st ser., 9: 9 (1888); 2nd ser., 10: 647 (1905). 20 references.

SAMUELY, FRANZ. Melanine und übrige Farbstoffe der Tierwelt. *In* Abderhalden, *Biochem. Handl.* 6: 293-378 (1911). Bibl. footnotes.

WELLS, H. G. Melanin. *In his* Chemical pathology, 4th ed., 471-478 (1920). 45 footnotes.

See also PIGMENTS, ANIMAL.

MELEZITOSE

HARDING, T. SWANN. History of melezitose, its discovery and methods of preparation. *Sugar* 25: 241 (1923). 22 references.

HENRY, A. Manna of larch and Douglass fir. Melezitose and lethal honey. *Pharm. J.* 112: 387-390 (1924). 32 references.

See also CARBOHYDRATES.

MELIBIOSE

LIPPMANN, E. O. v. Melibiose. *In his* Chemie der Zuckerarten, 2: 1585-1596 (1895). Bibl. through text.

MEYER-JACOBSON. Melibiose. *In their* Lehrb. org. Chem. 1, pt. 2: 1017 (1913). Bibl. footnotes.

See also CARBOHYDRATES.

MELLITH. See GRANITE.**MELLITIC ACID**

DORHN, M., and THIELE, A. Mellithsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1332-1334 (1911). Bibl. footnotes.

MEYER-JACOBSON. Mellithsäure. *In their* Lehrb. org. Chem. 2, pt. 1: 592 (1902). Bibl. footnotes.

MELTING POINTS

BRIDGMAN, P. W. Change of phase under pressure. Phase diagrams of eleven substances. *Phys. Rev.* (2) 3: 126-141, 153-203 (1914).

DAY, ARTHUR L. Das Studium der Mineralschmelzpunkte. *Fortschritte Mineral.* 4: 115-160 (1914). Bibl. footnotes.

MENGE, GEORGE A. A study of melting point determinations with special reference to the melting point requirements of the U. S. Pharmacopeia. *U. S. Hyg. Lab., Bull. No.* 70, 1910. Bibl., p. 100-101.

MEMBRANES

ZANGGER, HEINRICH. Ueber Membranen und Membranfunktionen. *Ergeb. Physiol.* 7: 99-118 (1908).

MEMBRANE EQUILIBRIA

GARNER, W. E. Membrane equilibria. *In* Fourth rept. on colloid chemistry, 1922, p. 114-121. 35 references.

MENTHOL

BARTELT, K. Menthol. *In* Abderhalden, *Biochem. Handl.* 7: 376-384 (1912). 100 footnotes.

"Menthol." *Ind.-Cat. S. G. O.*, 1st ser., 9: 164-165 (1888); 2nd ser., 10: 647 (1905). 25 references.

See also ESSENTIAL OILS.

MENTHONE

BARTELT, K. Methon. *In* Abderhalden, *Biochem. Handl.* 7: 432-443 (1912). 60 footnotes.

"Methone." *Ind.-Cat. S. G. O.*, 1st ser., 9: 164 (1888); 2nd ser., 10: 729 (1905). 25 references.

MEYER-JACOBSON. Methon. *In their* Lehrb. org. Chem. 2, pt. 1: 891-902 (1902). Bibl. footnotes.

See also ESSENTIAL OILS.

MERCAPTANS

FUNK, CASIMIR. Mercaptane. *In* Abderhalden, *Biochem. Handl.* 4: 934-943 (1911). Bibl. footnotes.

GOODRIDGE, FREDERIC G. Biochemical studies of mercaptan. Thesis, Columbia Univ., 1915. 60 p. Bibl., p. 58-60.

MERCERIZATION

CLIBBENS, DOUGLAS A. The mercerization of cotton. *J. Textile Inst.* 14: 217-249T (1923); Shirley Inst. Mem. 2: 187-189 (1923). 79 references.

GARDNER, PAUL. Die Mercerisation der Baumwolle und die Appretur der mercerisierten Gewebe. Berlin, Springer, 1912. 194 p. Patents, p. 35-60.

WILHELM, G. Mercerisierverfahren. *Kunststoffe* 10: 105-106, 115-118 (1920). 86 patents.

See also COTTON (Woodbury), TEXTILES.

MERCURY

ANDRÉ, G. Mercure. *In* Moissan, *Chim. min.* 5: 196-485 (1906). 1756 footnotes.

EVANS, ISABEL P. Quicksilver in North America. *U. S. Geol. Sur., Mineral Resources*, 1917, pt. 1: 425-455; 1918, pt. 1: 179-182. Includes occurrence, chemistry, physics and metallurgy, mercury lamp. Subject index. Supplement in *Ibid.* 1923, pt. 1: 42-46. 57 references.

GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Quicksilver. (1913-1919.) 1922. 39 p. Bibl., p. 35-39.

GUTBIER, *et al.* Ueber kolloides Quecksilber. *Kolloid-Z.* 19: 33-36, 291-297 (1916). 46 footnotes.

JOANNIS, M. Mercure. *In* Frémy, *Enc. chim.* 3, 14^e cahier: 292-299 (1885). Classified by compounds.

LEY, H. Quecksilber. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 2: 677-687 (1905). 485 references.

McCASKEY, H. D. Quicksilver. U. S. Geol. Sur., Mineral Resources 1910, pt. 1: 705-710; 1911, pt. 1: 920-921. 183 references, 1854-1910.

MEHREN, —. Fortschritte auf dem Gebiete der Erforschung des Quecksilbers. Edel-Erden u. -Erze 2: 89-91, 97-99 (1921). References through text.

MELLOR, J. W. Mercury. *In his* Inorg. theor. chem. 4: 695-1048 (1923). Bibls. through chapter.

"Mercury and its compounds." *Ind.-Cat. S. G. O.*, 1st ser., 9: 173-192 (1888); 2nd ser., 10: 736-752 (1905).

PETERS, F., and LOWENSTEIN, W. Quecksilber. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 333-1287, 1655-1752 (1914). References through text.

RANSOME, F. L. Quicksilver in 1920-1921. U. S. Geol. Sur., Mineral Resources 1920, pt. 1: 437-439; 1921, pt. 1: 117-120. 80 references.

U. S. Tariff Commission. Quicksilver. *In its* Tariff information survey, No. 21, 1920, p. 269-276.

MERCURY: Ammonium compounds.

FRANKLIN, EDWARD C. Mercury nitrogen compounds. *J. Am. Chem. Soc.* 29: 35-66 (1907). 200 footnotes.

FRANKLIN, EDWARD C. Theory of the mercury ammonia compounds. *Am. Chem. J.* 47: 361-397 (1912). Bibl. footnotes.

MELLOR, J. W. Ammoniobasic and aquo-ammonia-basic salts of mercuric chloride. *In his* Inorg. theor. chem. 4: 871-872 (1923). About 125 references.

PETERS, F., and LOWENSTEIN, W. Quecksilber, Stickstoff und andere Elemente im Allgemeinen. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 533-542, 562-570, 612-621, 701-710, 756-763, 857-860 (1914). References through text.

MERCURY: Analysis.

BOUTON, CRAIG M., and DUSCHAK, L. H. The determination of mercury. U. S. Bur. Mines, Tech. Paper No. 227, 1920. 44 p. Bibl., p. 24-41. 124 references, annotated; arranged by method with author index.

PETERS, F., and LOWENSTEIN, W. Quecksilber—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 495-504 (1914). Classified.

PRETZFELD, C. J. Gravimetric determination of mercury. *J. Am. Chem. Soc.* 25: 198-209 (1903). 30 references.

MERCURY: Ores.

BRADLEY, W. W. Quicksilver resources of California with a section on metallurgy and ore-dressing. *Calif. State Min. Bur., Bull. No. 78*, 1918. 399 p. Bibl., p. 354-362. 300 entries.

HALSE, EDWARD. Mercury ores. *London, Murray*, 1923. 101 p. Bibl., p. 93-101.

MERCURY: Organic compounds.

BRIEGER, RICHARD, and SCHULEMANN, WERNER. Ueber die Mercurierung einiger Naphthalin Derivative. *J. prakt. Chem.* 197: 97-183 (1913-1914). Bibl. footnotes.

JÜRGENS, J. [Review of the organic mercury compounds.] *Chem. Weekblad* 18: 627-630, 641-643 (1921).

PETERS, F., and LOWENSTEIN, W. Verbindungen von Oxyden und Salzen des Quecksilbers mit organischen Stoffen. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 876-978 (1914). References through text.

WHITE, E. C. New organic mercurials and their therapeutic applications. *Ind. Eng. Chem.* 16: 1038 (1924). 33 references.

WHITMORE, FRANK C. Bibliography of the literature of organic mercurials. *J. Ind. Eng. Chem.* 11: 1084-1091 (1919). About 850 references, arranged by compounds.

WHITMORE, FRANK C. Organic compounds of mercury. *New York, Chem. Cat. Co.*, 1921. 397 p. Bibl., p. 371-380. Includes patents.

WHITMORE, FRANK C. Recent developments in the chemistry of organic mercury compounds. *Ind. Eng. Chem.* 15: 419 (1923). 37 references.

MERCURY BROMIDES

MELLOR, J. W. Mercurous and mercuric bromides. *In his* Inorg. theor. Chem. 4: 876-877, 882-884 (1923). 40 and 150 references.

PETERS, F., and LOWENSTEIN, W. Quicksilber und Brom. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 740-748 (1914). References through text.

MERCURY CHLORIDES

MELLOR, J. W. Mercurous and mercuric chlorides. Double and complex salts of mercuric chloride. *In his* Inorg. theor. chem. 4: 813-816, 834-839, 861-862 (1923). 400, 550 and 100 references.

"Mercurous and mercuric chlorides." *Ind.-Cat. S. G. O.*, 1st ser., 9: 185-190 (1888); 2nd ser., 10: 738-744 (1905).

MERCURY CHLORIDES—Cont'd

PETERS, F., and LOWENSTEIN, W. Mercurio- und Mercurichloride. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 630-677 (1914). References through text.

MERCURY CYANIDE

"Mercury cyanide." *Ind.-Cat. S. G. O.*, 1st ser., 9: 190 (1888); 2nd ser., 10: 744 (1905). 30 references.

PETERS, F., and LOWENSTEIN, W. Mercuricyanid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 831-844 (1914).

MERCURY IODIDES

MELLOR, J. W. Mercurous and mercuric iodides. Double and complex salts of mercuric iodide. The iodo-mercurates. *In his* Inorg. theor. chem. 4: 900-901, 918-920, 941-942 (1923). 100, 400 and 150 references.

PETERS, F., and LOWENSTEIN, W. Mercurijodid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 773-792 (1914).

MERCURY NITRATES

MELLOR, J. W. Mercurous and mercuric nitrates. *In his* Inorg. theor. Chem. 4: 990-991, 998-999 (1923). 100 and 125 references.

PETERS, F., and LOWENSTEIN, W. Mercurio- und Mercurinitrate. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 549-562 (1914).

MERCURY OXIDES

MELLOR, J. W. Mercurous and mercuric oxides. *In his* Inorg. theor. chem. 4: 770-771, 781-784 (1923). 40 and 300 references.

PETERS, F., and LOWENSTEIN, W. Mercurioxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 507-524 (1914).

MERCURY OXYCHLORIDE

PETERS, F., and LOWENSTEIN, W. Quicksilber, Chlor und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 679-696 (1914).

MERCURY SULFATES

MELLOR, J. W. Mercurous and mercuric sulfates. *In his* Inorg. theor. chem. 4: 968-969, 976-977 (1923). 50 and 100 references.

PETERS, F., and LOWENSTEIN, W. Mercurisulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 599-605 (1914).

MERCURY SULFIDES

MELLOR, J. W. The sulfides of mercury. *In his* Inorg. theor. chem. 4: 957-961 (1923). 450 references.

PETERS, F., and LOWENSTEIN, W. Mercurisulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 571-588 (1914).

MESITYL OXIDE

MEYER-JACOBSON. Mesityloxyde. *In their* Lehrb. org. Chem. 1, pt. 1: 1019 (1907). 40 references.

MESITYLENE

BAUM, FRITZ. Mesitylen (1, 3, 5-Tri-methylbenzene). *In* Abderhalden, Biochem. Handl. 1: 292 (1911). 110 references (includes derivatives).

MESOTAN

"Mesotan." *Ind.-Cat. S. G. O.*, 2nd ser., 10: 765 (1905). 24 references.

MESOTHORIUM

SCHLUNDT, HERMAN. Mesothorium. U. S. Bur. Mines, Tech. Bull. No. 265, 1922. 57 p. Bibl., p. 54-56. 56 references.

See also MONAZITE, RADIUM, RARE EARTHS, THORIUM.

MESOXALIC ACID

MEYER-JACOBSON. Mesoxalsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1192-1197 (1913). Bibl. footnotes.

METABOLISM

AARON, HANS, and GRALKA, RICHARD. Allgemeine Stoffwechsellehre. 1. Allgemeine biochemische Grundlagen der Ernährung. *In* Oppenheimer, Handb. Biochem., 2nd ed., 6: 279-344 (1924). 163 footnotes.

ABDERHALDEN, EMIL. Synthese der Zellbausteine in Pflanze und Tier; Lösung des Problems der künstlichen Darstellung der Nahrungsstoffe. Berlin, Springer, 1912. 128 p. Bibl., p. 113-128.

ALPERIN, DAVID. Contribution to the knowledge of nucleoprotein metabolism, with special reference to uricolysis and to the properties of uricase. Thesis, Columbia Univ., 1912. 46 p. Bibl., p. 37-46.

ATKINSON, HARRY V. The transformation of protein into fat and fat into carbohydrate in the body. J. Metabolic Res. 1: 565-608 (1922). Thesis, Univ. Illinois, 1922. 43 p. Bibl., p. 40-43.

AUB, JOSEPH C., and TAYLOR, MARTHA. The effect of body tissues other than the thyroid upon the basal metabolism rate. Endocrinology 6: 255-269 (1922). 59 references.

BARBOUR, HENRY G. The effects of certain drugs and poisons upon the metabolism. *In* Barker, Endocrinology and metabolism, 3: 717-785; references, 5: 345-509 (1923).

BARKER, LEWELLYS F. Endocrinology and metabolism. New York, Appleton, 1922. 5 vols. Vol. 5 is bibl. and general index. 694 p. p. 345-509 deal with metabolism specifically.

BENEDICT, FRANCIS G., and TALBOT, FRITZ B. Metabolism and growth

- from birth to puberty. Washington, Carnegie Inst., Pub. No. 302. 213 p. Bibl. footnotes.
- BICKEL, A., and WOHLGEMUTH, J. Die Rolle der Leber im intermediären Eiweissstoffwechsel. *Ergeb. allgem. Path.* 12: 606-612 (1908). 170 references.
- BOOTHBY, W. M., and SANDIFORD, IRENE. Normal standards for the estimation of the basal metabolism rate. *J. Biol. Chem.* 54: 783-803 (1922). 28 references.
- BOOTHBY, WALTER M., and SANDIFORD, IRENE. Laboratory manual of the technic of basal metabolism rate determinations. Philadelphia, Saunders. 1920. 117 p. Bibl., p. 89-93.
- BOOTHBY, WALTER M., and SANDIFORD, IRENE. Basal metabolism. *Physiol. Rev.* 4: 69-161 (1924). 714 references.
- CALVARY, MARTIN. Die Bedeutung des Zuckers in der Säuglingsnahrung. *Ergeb. inneren Medizin* 10: 699-702 (1913).
- CASPARI, W. Der parenterale Eiweissstoffwechsel. In Oppenheimer, *Handb. Biochem., Ergänzungsband*, 1913, 708-738. 136 references.
- CRONHEIM, WALTER. Gesamtstoffwechsel der Nichtsäuger. Die kaltblutigen Wirbeltiere. In Oppenheimer, *Handb. Biochem.* 4, pt. 2: 405-445 (1910). 117 footnotes.
- DAKIN, H. D. Oxidations and reductions in the animal body. New York, Longmans, 1922. 176 p. Bibl., p. 145-172.
- DU BOIS, EUGENE F. Basal metabolism in health and disease. Philadelphia, Lea, 1924. 372 p. Bibl. footnotes.
- FÜRTH, OTTO v. Stoffwechsel des Herzens und des Muskels. In Oppenheimer, *Handb. Biochem.* 2nd ed., 8: 31-80 (1923). 142 references.
- FÜRTH, OTTO v. The problems of physiological and pathological chemistry of metabolism. Philadelphia, Lippincott, 1916. 667 p. Bibl. footnotes. References to many earlier bibls. not referred to in this work.
- GRAFE, E. Quantitative Bestimmung des Gasstoffwechsels mittels Pettenkofer-Tigerstedt-Jaquet und Benedict-Apparatus. In Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 10: 309-414 (1923). Bibl. footnotes.
- GROSSER, PAUL. Organische und anorganische Phosphate im Stoffwechsel. *Ergeb. inneren Medizin* 11: 119-123 (1913).
- HARRIS, J. ARTHUR, and BENEDICT, FRANCIS G. A biometric study of basal metabolism in man. Washington, Carnegie Inst., Pub. No. 279, 1919. 266 p. Bibl. footnotes.
- HERBST, O. [Concerning the physiology of metabolism in boyhood with special reference to certain mineral constituents.] *Jahrb. Kinderheilk.* 76, *Ergänzungs.*: 40-130 (1912).
- HÖBER, RUDOLF. Zur physikalischen Chemie des Stoff- und Energiewechsels. In *his* *Physikalische Chemie der Zelle*, 4th ed., 1914, p. 729-780. Bibl. footnotes.
- JACOBY, MARTIN. Der Stoffwechsel und Energiwechsel der Zelle und der Einzelligen. In Oppenheimer, *Handb. Biochem.* 2: 142-192 (1908). 183 footnotes.
- KLOTZ, MAX. Die Bedeutung der Getreidemehle für die Ernährung. *Ergeb. inneren Medizin* 8: 593-597 (1912). 216 references.
- KRUMMACHER, OTTO. Prinzipien der allgemeinen Stoff- und Energiewechsels. *Ergeb. physiol.* 5: 746-747 (1906); 7: 445-446 (1908). 54 references.
- LANGSTEIN, LEO. Die Energiebilanz des Säuglings. *Ergeb. Physiol.* 4: 851-853 (1905). 56 references.
- LOEWI, OTTO. Untersuchungen über den Nucleinstoffwechsel. Leipzig, Vogel, 1900. 29 p. Bibl., p. 24-25.
- LONDON, E. S. Mundverdauung und Magenverdauung. In Oppenheimer, *Handb. Biochem.* 3, pt. 2: 56-94 (1909). 153 footnotes.
- LUSK, GRAHAM. History of metabolism. In Barker, *Endocrinology and metabolism*, 3: 3-78; references, 5: 345-509 (1922).
- LUSK, GRAHAM. The specific dynamic action of various food factors. *Medicine* 1: 353-354 (1922). 43 references.
- MCCRUDDEN, F. C. The effect of castration on the metabolism. *J. Biol. Chem.* 7: 185-197 (1910). 100 footnotes.
- MACKENZIE, GEORGE M. The suprarenal system and carbohydrate metabolism. *Arch. Inter. Med.* 19: 593-610 (1917). 87 footnotes.
- MAGNUS, ADOLF. Physiologie des Stoffwechsels. In Noorden, *Handb. pathologie des Stoffwechsels*, 1906, 1: 1-480. References through text.
- MARRIOTT, W. McKIM. Review of the literature on the metabolism of normal infants. *Am. J. Diseases Children* 12: 88-102 (1916). 54 footnotes.
- MATTILL, HENRY A., and HELEN I. Mineral metabolism. In Barker, *Endocrinology and metabolism*, 3:

METABOLISM—Cont'd

- 303-340; references, 5: 345-509 (1922).
- MEIER, KURT. Beiträge zur Stoffwechsel des Kaninchens. Dissertation, Zürich, 1920. 146 p. Bibl., p. 142-144.
- MEIGS, E. B., BLATHERWICK, N. R., and CARY, C. A. Physiology of phosphorus and calcium metabolism as related to milk secretion. *J. Biol. Chem.* 37: 1-75 (1919). 60 footnotes.
- "Metabolism." *Ind.-Cat. S. G. O.*, 2nd ser., 10: 767-772 (1905).
- MURLIN, JOHN R. Metabolism of mother and off-spring before and after parturition. *In* Harvey Lectures, 1916-1917: 242-247. 110 references.
- MURLIN, JOHN C. Normal processes of energy metabolism. *In* Barker, *Endocrinology and metabolism*, 3: 515-660; references, 5: 345-509 (1922).
- OPPENHEIMER, CARL and PINCUSOHN, LUDWIG. Der intermediäre Stoffwechsel. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 1: 658-721 (1911). 183 footnotes.
- PACK, GEO. T., and UNDERHILL, FRANK P. Influence of benzyl benzoate upon nitrogen metabolism. *J. Metabolic Research* 2: 73-105 (1922). 60 references.
- PATON, DIARMID N. The nervous and chemical regulators of metabolism. London, Macmillan, 1913. 217 p. Bibl., p. 212-217.
- PINCUSSEN, LUDWIG. Die Ausnutzung der Nährstoffe. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 5: 295-344 (1924). 157 footnotes.
- PRYM, O. Dünndarmverdauung. *In* Oppenheimer, *Handb. Biochem.*, 3, pt. 2: 95-123 (1909). 136 footnotes.
- ROSE, WM. C. Purine metabolism. *Physiol. Rev.* 3: 588-602 (1923). 336 references.
- SCHUNERT, A. Vorgänge im Enddarm (Dickdarm). *In* Oppenheimer, *Handb. Biochem.* 3, pt. 2: 124-152 (1909). 203 footnotes.
- SCHUNERT, A. Besonderheiten der Verdauung bei Tieren mit mehrhöligem Magen (Wiederkäuer, Kaltblütern und Vögeln). *In* Oppenheimer, *Handb. Biochem.*, 3, pt. 2: 153-170 (1909). 90 footnotes.
- SCHITTEHELM, ALFRED. Der Nukleinstoffwechsel. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 1: 489-539 (1911). 300 footnotes.
- SCHULZ, F. N. Verdauungsdrüsen niederer Tiere. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 224-244 (1910). 81 footnotes. 2nd ed., 4: 631-651 (1924). 111 footnotes.
- SHERWIN, CARL P. Fate of foreign organic compounds in the animal body. *Physiol. Rev.* 2: 238-276 (1922). 107 references.
- SHOHL, A. T. Mineral metabolism in relation to acid-base equilibrium. *Physiol. Rev.* 3: 531-543 (1923). 242 references.
- SIEBECK, R. Gasometrische Methoden zur Bestimmung des Stoffwechsels von Zellen und Geweben. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 10: 251-288 (1923). Bibl. footnotes.
- SPECK, C. Ueber Kraft- und Ernährungsstoffwechsel. *Ergeb. Physiol.* 2: 1-5 (1903). 158 references.
- STEHLE, R. L. Effect of hydrochloric acid upon mineral excretion. *J. Biol. Chem.* 31: 461 (1917). 40 references.
- TANGL, FRANZ. Allgemeine biochemische Grundlagen der Ernährung. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 2: 1-55 (1909). 69 footnotes.
- TIGERSTEDT, ROBERT. Der Energiewechsel. Die potentielle Energie der Nahrungsstoffe. Umfang des Energiewechsels. Die Energiebilanz des menschlichen Körpers. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 2: 1-92 (1910). 101 footnotes.
- TIGERSTEDT, R. Die Physiologie des Stoffwechsels. *In* Nagel, *Handb. Physiologie des Menschen*, 1: 331-556 (1905). Bibl. footnotes.
- TIGERSTEDT, R. Nahrungsbedarf des erwachsenen Menschen in dessen Beziehung zu der körperlichen Arbeit. *Fortschr. Naturw. Forsch.* 5: 297-300 (1912).
- WEBER, S. Ueber die Beeinflussung des Stoffwechsels durch einige pharmakologisch wichtige Stoffe. *Ergeb. Physiol.* 3: 233-252 (1904). 550 references.
- WENDT, GEORGE V. Mineralstoffwechsel. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 1: 561-657 (1911). 176 footnotes. 2nd ed., 8: 183-255 (1924). 176 footnotes.
- WIELAND, ERNEST. Verdauung und Resorption bei Wirbellosen. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 2: 299-343 (1909). 221 footnotes.
- WIELAND, ERNST. Gesamtstoffwechsel der Nichtsäuger. Der Stoffwechsel der Wirbellosen. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 2: 446-528 (1910). 377 footnotes.
- ZUNTZ, LEO. Stoffaustausch zwischen Mutter und Frucht. *In* Oppenheimer, *Handb. Biochem.* 4, pt. 2: 93-103 (1910). 51 footnotes.

ZUNTZ, N. Betrachtungen ueber die Beziehungen zwischen Nährstoffen und Leistungen des Körpers (Die Quellen der Muskelkraft). In Oppenheimer, Handb. Biochem. 4, pt. 1: 826-881 (1911). 105 footnotes.

ZUNTZ, L. Der Stoffaustausch zwischen Mutter und Frucht. *Ergeb. Physiol.* 7: 403-409 (1908). 186 references.

ZUNTZ, L. Stoffwechsel und Sexualität des Weibes. In Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, p. 675-707. 109 footnotes.

Serial

Zentralblatt für die gesamte Physiologie und Pathologie des Stoffwechsels mit Einschluss der experimentellen Therapie. 1906-. (Continuation of Zentralblatt für Stoffwechsel- und Verdauungskrankheiten). Covers experimental biology, pharmacology, toxicology, physiology and physiological chemistry, experimental clinical studies, immunity, foods and feedings.

See also FATS, LECITHIN, NUTRITION, PROTEINS.

METABOLISM: Abnormal.

BERGMANN, G. VON. Störungen des Allgemeinstoffwechsels. Die Kastration. In Oppenheimer, Handb. Biochem. 4, pt. 2: 194-207 (1910). 35 footnotes.

BERGMANN, G. VON. Störungen des Allgemeinstoffwechsels. Die Fettsucht. In Oppenheimer, Handb. Biochem. 4, pt. 2: 208-237 (1910). 51 footnotes.

BRUGSCH, TH. Der Hungerstoffwechsel. In Oppenheimer, Handb. Biochem. 4, pt. 1: 285-306 (1911). 98 footnotes.

DU BOIS, EUGENE F. Metabolism in fever and in certain infections. In Barker, Endocrinology and metabolism 4: 95-151; references, 5: 511-694 (1922).

GAMBLE, JAMES L. Review of recent literature on conditions of abnormal metabolism in infants. *Am. J. Diseases Children* 13: 362-389 (1917). 70 references.

GRAFE, E. Der Stoff- und Kraftwechsel bei der Ontogenese. *Biochem. Centr.* 6: 441-448 (1907). 30 references.

GRAFE, E. Die pathologische Physiologie des Gesamtstoff- und Kraftwechsels bei der Ernährungs des Menschen. *Ergeb. Physiol.* 21, pt. 2: 1-499 (1923). About 1900 references through text. Has references to bibls. on various aspects of the subjects covered.

HALVERSON, J. O., BERGEIM, O., and HAWK, P. B. Metabolic study of goiter with the effect of thyroid and thymus treatment. *Arch. Inter. Med.* 18: 800-829 (1916). 73 footnotes.

HIRSCH, R. Störungen des Allgemeinstoffwechsels. Der Morbus Basedowii. In Oppenheimer, Handb. Biochem. 4, pt. 2: 164-180 (1910). 64 footnotes.

HIRSCH, R. Störungen des Allgemeinstoffwechsels. Myxodem, Kretinismus. In Oppenheimer, Handb. Biochem. 4, pt. 2: 181-190 (1910). 44 footnotes.

JOSLIN, ELLIOTT P. Diabetic metabolism with high and low diets. *Carnegie Inst., Pub. No.* 323. Washington, 1923. 334 p. Bibl., p. 1-2. Bibl. footnotes.

"Metabolism in diabetes." *Ind.-Cat. S. G. O.*, 3rd ser., 4: 486-488, 515-516 (1922).

MOHR, L. Gesamtstoffwechsel bei Anämien, Kachexien, usw. In Oppenheimer, Handb. Biochem. 4, pt. 2: 372-404 (1910). 209 footnotes.

MORAWITZ, P. Spezielle Stoffwechselstörungen. Pathologie des Wasser- und Mineralstoffwechsels. In Oppenheimer, Handb. Biochem. 4, pt. 2: 238-333 (1910). 671 footnotes. 2nd ed., 8: 256-337 (1924). 527 footnotes.

MOSENTHAL, HERMAN O. Metabolism in nephritis. In Barker, Endocrinology and metabolism 4: 311-409; references 5: 511-697 (1922).

NEUBERG, CARL. Spezielle Stoffwechselstörungen. Anomalien des Eiweißabbaues. In Oppenheimer, Handb. Biochem. 4, pt. 2: 334-371 (1910). 194 footnotes.

NOORDEN, CARL V. Handbuch der Pathologie des Stoffwechsels. Berlin, Hirschwald, 1906-1907. 2 vols. Bibls. through text.

PERITZ, G. Störungen des Allgemeinstoffwechsels. Erkrankungen des Nervensystems. In Oppenheimer, Handb. Biochem. 4, pt. 2: 148-163 (1910). 71 footnotes.

PRATT, JOSEPH H. The metabolism in gout. In Barker, Endocrinology and metabolism 4: 411-455; references, 5: 511-694 (1922).

RICHTER, P. F. Störungen des Allgemeinstoffwechsels. Fieber. In Oppenheimer, Handb. Biochem. 4, pt. 2: 104-143 (1910). 195 footnotes.

UTHEIM, KIRSTEN. Advanced chronic nutritional disturbances in infancy. *J. Metabolic Res.* 1: 913-917 (1922); *Am. J. Diseases Children* 22: 330-350 (1921). 165 references.

WATANABE, C. K. Change of phosphate and calcium content in serum

METABOLISM: Abnormal—Cont'd

in guanidine tetany. *J. Biol. Chem.* 36: 531 (1918). 40 references.

WEBER, SIEGFRIED. Ueber Hungerstoffwechsel. *Ergeb. Physiol.* 1: 702-709 (1902). 190 references.

WELLS, H. G. Pathological conditions due or associated with, abnormalities in metabolism, including auto-intoxication. *In his* Chemical pathology, 4th ed., p. 530-596 (1920). 360 footnotes.

WILDER, R. M., BOOTHBY, W. M., and BEELER, C. Metabolism in diabetes. *J. Biol. Chem.* 51: 311-357 (1922). 48 references.

METALLOGRAPHY

BELAJEW, N. T. Crystallisation of metals. London, Univ. London press, 1923. 143 p. Bibl. at end of each chapter.

CAMPBELL, WM. Recent progress in metallography. *Trans. Am. Inst. Metals* 10: 269-331 (1916); *School of Mines Quart.* 36: 249-279 (1915). Classified.

DESCH, CECIL H. Metallography. 3rd ed. London, Longmans, 1922. 440 p. Bibl. footnotes.

GÜRTLER, W. Metallographie. *Fortschritte Chem.* 1: 39-48, 77-79, 369-376 (1909); 2: 29-38 (1910); 3: 53-69 (1910-1911); 4: 272-292 (1911); 6: 125-139 (1912-1913); 8: 107-116 (1913); 10: 193-207 (1914-1915). References through text.

HADFIELD, R., *et al.* Radiometallography. *Trans. Faraday Soc.* 15: 1-24 (1920). Bibl. to Dec., 1918.

HEYN, E. Report on the progress of metallography since the commencement of the year 1909 to the end of the year 1911. *Intern. Assoc. Testing Materials*, VI Congress, 1912, 2: No. 1. 58 p. 540 references.

JANECKE, ERNST. Employment of physical chemistry in metallography. *Ion* 1: 136-155, 209-229 (1908). Bibl. through text.

OBERHÖFFER, P., *et al.* *Fortschritte der Metallographie. Stahl u. Eisen* 34: 1299, 1348, 1715, 1744, 1798, 1853, 1888 (1914); 35: 269, 934 (1915); 36: 804 (1916); 37: 112, 140, 211, 481, 502, 1003, 1054 (1917); 38: 15, 37 (1918). Bibl. footnotes.

RÜFER, RUDOLF. Elements of metallography. New York, Wiley, 1909. 342 p. 200 references on binary fusion diagrams, p. 329-336.

SAVOIA, UMBERTO. Metallography applied to siderurgic products. New York, Spon, 1910. 180 p. Bibl. at ends of chapters.

TAMMANN, GUSTAV. A textbook of metallography. Chemistry and physics of the metals and their alloys. New York, Chem. Cat. Co., 1924. 385 p.

METALLURGY

BÄCKSTRÖM, HELMER. Grain growth in metals. *Jernkonterets Annaler* 103: 357-395 (1919).

DESCH, CECIL H. Intermetallic compounds. New York, Longmans, 1914. 116 p. Bibl., p. 109-113.

FRANKEL, W. Metallurgie einschl. der Elektrometallurgie. *Fortschritte Chem.* 3: 151-172 (1910-1911). References through text.

GT. BRIT. Subject list of works on mineral industries in the library of the patent office. Part 3. Non-ferrous and general metallurgy, assaying and fuel combustion. London, 1912. 132 p.

HATFIELD, W. H., and THIRKELL, G. L. Bibliography of investigations on cold work and allied subjects. *J. Inst. Metals* 22: 85-91 (1919). 167 references.

HOFMAN, H. O. General metallurgy. New York, McGraw, 1913. 909 p. Bibl. footnotes.

HOFFMANN, R. Das Metallhüttenwesen. *Chem.-Ztg.* 29: 935-941 (1905). 109 footnotes. 31: 635-637, 651-653, 665-667 (1907). 92 footnotes. 32: 780-781, 792-794 (1908). 53 footnotes. 33: 477-478, 490-491, 498-499 (1909). 55 footnotes.

KAUFMANN, F. Ueber Fortschritte in den Metallhüttenkunde. *Chem.-Ztg.* 30: 539-541 (1906). 43 footnotes.

LANGE, OTTO. Metallurgie. *In his* Chemisch-Technische Vorschriften 1: 1-463 (1923). Largely patents.

LOEBE, R. Metallurgie einschl. der Elektrometallurgie. *Fortschritte Chem.* 5: 31-52 (1912); 6: 229-240, 295-308 (1912-13); 8: 255-276 (1913). References through text.

NEUMANN, B. Technische Fortschritte im Metallhüttenwesen. *Z. angew. Chem.* 21: 1789-1798, 1835-1842 (1908); 197 footnotes. 22: 2181-2187, 2229-2234 (1909); 116 footnotes. 23: 2068-2077 (1910); 88 footnotes. 25: 193-203 (1912); 113 footnotes.

NEUMANN, B. Metallhüttenwesen. *Glückauf* 41: 1047-1059 (1905); 42: 811-814, 845-853 (1906); 43: 1370-1375, 1405-1411 (1907); 44: 1627-1633, 1664-1667 (1908); 45: 1473, 1516, 1550 (1909); 46: 1645-1658 (1910); 47: 1669, 1724, 1764 (1911); 48: 1529, 1569, 1613 (1912); 49: 1677, 1723, 1766 (1913); 51: 6, 38,

- 60, 84 (1915); 52: 569, 589, 613, 633, 657, 686 (1916); 54: 6, 21, 36, 45, 64, 77, 98 (1918). Bibl. footnotes.
- PEDDIE, ROBT. A. Metallurgical bibliography, 1901-1906. London, Library supply co., 1907. 12 p. Reprinted from Library World, 1907.
- PETERS, F. Metallurgie einschl. der Elektrometallurgie. Fortschritte Chem. 1: 279-301 (1909); 2: 281-297 (1910). References through text.
- PETERS, FRANZ. Forschungen und Fortschritte auf dem Gebiet der weniger häufigen Metalle in den Jahren 1906-1915. Glückauf 52: 705, 729, 745, 771, 789, 814, 836, 861, 885 (1916). Bibl. footnotes.
- SCHNABEL, C. Ueber die Fortschritte in der Gewinnung der Metalle (ausser dem Eisen). Chem.-Ztg. 27: 135-140 (1903); 48 references. 28: 335-338 (1904); 28 references.
- SOCIETY OF CHEMICAL INDUSTRY. Metallurgy of the non-ferrous metals. In Reports of the progress of applied chemistry, 2: 262-275 (1917); 3: 224-237 (1918); 4: 226-248 (1919); 5: 249-270 (1920); 6: 274-294 (1921); 7: 230-244 (1922); 8: 251-268 (1923). Bibl. footnotes (about 80 each year).
- STOCKMEIER, H. Fortschritte der chemischen Metallbearbeitung und verwandter Zweige. Chem.-Ztg. 31: 431-434 (1907); 36 footnotes. 32: 743-744, 756-758 (1908); 59 footnotes.
- TABLES ANNUELLES. Métallurgie. 1: 672-722 (1910); 2: 727-753 (1911); 3: 538-587 (1912); 4: 1274-1372 (1913-1916). Includes references to all important numerical data.
- VARLEY, THOMAS, *et al.* The chloride volatilization process of ore treatment. U. S. Bur. of Mines, Bull. No. 211, 1923. 99 p. Bibl. of Howe's work, p. 26-27. Partial list of patents relating to the chloride volatilization process, p. 93-95. Publications on the volatilization of ores, p. 96.
- Serial*
- Bulletin, The institution of mining and metallurgy (London). Each bulletin contains a list of recent books and papers on mining and metallurgical subjects. Brief abstracts are given.
- Glückauf, Berg und Hüttenmännische Zeitschrift. 1865-. Each number contains brief abstracts on mineralogy and geology, metallurgy, chemical technology, chemistry and physics. Books and patents are included.
- Journal of the Iron and Steel Institute. 1880-. Abstracts are classified as follows: Analysis, iron ores, fuels, refractories, production of iron and steel, physical and chemical properties. List of new books is included in each volume.
- Metal industry (London). 1912-. Some numbers contain brief abstracts of recent literature on non-ferrous metals.
- Metallurgie. 1904-. Each number contains an abstract section. Continued as Ferrum in 1912.
- Stahl und Eisen. Since 1907 there has appeared "Zeitschriftenschau," a classified list of references with brief annotations. Some years this was reprinted as a separate.
- Transactions of the American Society for Steel Treating. 1921-. Contains brief abstracts of publications of interest to metallurgists and steel treaters. "Reviews of recent patents."
- Zeitschrift für das Berg, Hütten und Salinenwesen in preussische Staate. 1853-. The Abhandlungsheft contains "Übersicht des Inhalts den technischen Zeitschriften." There are no abstracts. The classification used is: Geological works; mining, metallurgical and saline industries; metallurgy; saline practices; chemical industries; machinery; chemical methods; physical methods.
- Zeitschrift für Metallkunde. 1910-. The abstracts cover the general field of metals and are classified as follows: General, structure, chemical, physical, mechanical, standards, melting and casting, surface treatment, uses, waste metals, factory practice. See also ELECTROMETALLURGY; names of metals.
- METALS**
- "Effect of temperature upon the properties of metals." Proc. Am. Soc. Testing Materials 24, II: 128-140 (1924). 216 references. Chronological, 1828-1924.
- EVANS, ISABEL F. Publications by survey authors on metals and non-metals, except fuels. U. S. Geol. Sur., Bull. No. 580, 1915. 1200 references on p. 413-455.
- See also names of metals.
- METALS: Distillation.**
- KAHLBAUM, GEORG W. A., ROTH, K., and SIEDLER, P. Ueber Metalldestillation und ueber destillierte Metalle. Z. anorg. Chem. 29: 177-294 (1902). Bibl. footnotes.
- METALS: Fatigue.**
- MAILÄNDER, RICHARD. Ermüdungerscheinungen und Dauerversuche. Stahl u. Eisen 44: 721-725 (1924). 225 references.

METALS: Fatigue—Cont'd

MOORE, H. F., and KOMMERS, J. B. An investigation of the fatigue of metals. Univ. Ill. Eng. Expt. Sta., Bull. No. 124, 1921. 178 p. Bibl., p. 168-178. 132 references. Supplement in Bull. No. 142, 1924, p. 82-86. 55 references.

METALS: Gases in.

BOSE, E. Chronologische Uebersicht der Literatur ueber Absorption (Okklusion) und Diffusion von Gasen, speziell Wasserstoff und Sauerstoff in Metallen. Z. physik. Chem. 34: 710-712 (1900). About 80 references, covering 1834-1899.

HADFIELD, ROBERT. The occlusion of gases in metals. Trans. Faraday Soc. 14: 173-191 (1919). 73 references.

JORDAN, LOUIS. Gases in metals. Proc. Am. Soc. Testing Materials 23, pt. 2: 7-20 (1923). Bibl. footnotes.

SMITH, DONALD P. The occlusion of hydrogen by the metallic elements and its relation to magnetic properties. J. Phys. Chem. 23: 186-202. 38 references.

METALS: Hardness.

AITCHISON, LESLIE. Engineering steels. London, MacDonald, 1921. 427 p. "Bibliography of original papers on the hardness of metals," p. 326-331.

KURNAKOW, N. S., and ZECUZNY, S. F. Die Härte der festen Metalllösungen und der bestimmten chemischen Verbindungen. Z. anorg. Chem. 60: 1-37 (1908). 60 footnotes.

See also HARDNESS; MATERIALS, TESTING.

METALS: Passivity. See PASSIVITY.**METALS: Pyrophoric.**

BOHM, C. RICHARD. Pyrophore Metalle. Chem.-Ztg. 34: 361-363, 377-379 (1910). Bibl. footnotes.

See also CERIUM (Hirsch).

METALS: Season cracking.

Bibliography of season cracking. British non-ferrous metals research association, Bull. No. 6, 1922. 47 references, p. 14-18.

HATFIELD, W. H., and THIRKELL, G. L. Bibliography . . . on cold work and allied subjects. J. Inst. Metals 22: 85-91 (1919). Chronological.

See also CORROSION.

METALS: Surface tension.

SMITH, SYDNEY W. The surface tension of molten metals. J. Inst. Metals 12: 208-209 (1914). Standard works on capillarity and surface tension.

SMITH, SYDNEY W. Surface tension and cohesion in metals and alloys. J. Inst. Metals 17: 100-103 (1917). Classified by subject.

METAPHOSPHORIC ACID

GUTBIER, A. Metaphosphorsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 178-201 (1911). References through text.

METASTABILITY

MELLOR, J. W. Undercooling, supersaturation and metastability. In his Inorg. theor. chem. 1: 456 (1922). 100 references.

METEORITES

BERWERTH, FRIEDRICH. Fortschritte in der Meteoritenkunde seit 1900. Fortschritte Mineral. Kristal. Petr. 1: 258-276 (1911); 2: 227-229 (1912); 3: 245-248 (1913); 5: 265-270 (1916). 553 titles.

FARRINGTON, O. C. Catalogue of the meteorites of North America to Jan. 1, 1909. Mem. Nat. Acad. Sci. No. 13, 1915. 513 p. Selected bibl. with each fall.

MEUNIER, STANISLAS. Météorites. In Frémy, Enc. chim. 2nd Appendix, 2^{me} cahier, 1884. 532 p. Bibl. footnotes.

MICHEL, H. Die Feldspate der Meteoriten. Tschermak's Min. Petr. Mitt. 31: 616-623 (1912). 176 references.

MICHEL, H. Fortschritte in der Meteoritenkunde seit 1900. Fortschritte Mineral. Krist. Petr. 7: 245-326 (1922). 223 references from 1914-1922. Continues Berwerth.

METHANE

BAUM, FRITZ. Methan. In Abderhalden, Biochem. Handl. 1: 23-28 (1911). 140 references.

HASLAM, R. T., and FORREST, H. O. Methane by catalysis from CO in blue water gas. Gas Age Record, 52: 615-618, 620 (1923). 46 references.

MALISOFF, WM., and EGLOFF, GUSTAV. Methane. J. Phys. Chem. 22: 570-575 (1918). 150 references.

SCHLEEDE, ARTHUR, and LUCKOW, CURT. Ueber die Chlorierung des Methans. Ber. 55: 3710-3726 (1922). 40 footnotes.

See also HYDROCARBONS.

METHANOL

BASKERVILLE, CHARLES. Wood alcohol: a report on the chemistry, technology and pharmacology and the legislation pertaining to methyl alcohol. New York, College of the City of N. Y. n. d. About 200 footnotes.

- GERNGROSS, OTTO. Methylalkohol (Methanol). *In* Abderhalden, Biochem. Handl. 1: 369-383 (1911). 275 footnotes.
- "Methyl alcohol." Ind.-Cat. S. G. O., 2nd ser., 10: 781-782 (1905).
- WORDEN, E. C. Methyl alcohol. *In his* Technology of cellulose esters 1: 2402-2412 (1921). Bibl. footnotes.
- See also ACETIC ACID (Klar); ALCOHOLS.
- METHANOL: Analytical.**
- BAUER, HUGO. Analytische Chemie des Methylalkohols. Sammlung chem. chem.-tech. Vorträge 20: 279-352 (1913). Bibl. footnotes.
- GETTLER, ALEX. O. Critical study of methods for the detection of methyl alcohol. *J. Biol. Chem.* 42: 311-328 (1920). 123 references.
- LAWALL, CHARLES H. The detection of methanol in the presence of ethanol. *Trans. Wagner Free Inst. Sci.* 10: 55-62 (1923). Bibl. through text.
- VORISEK, ANTON. Detection of methyl alcohol in ethyl alcohol. *J. Soc. Chem. Ind.* 28: 825 (1909). 22 references.
- METHANOL: Toxicity.**
- MORSON, THOMAS D. The toxicity of methyl alcohol in relation to its industrial uses; a review of the published data. *J. Soc. Chem. Ind.* 37: 29-31T (1918). 65 references.
- METHYLAMINE.** See AMINES.
- METHYL CHLORIDE**
- BAUM, FRITZ. Methylchlorid. *In* Abderhalden, Biochem. Handl. 1: 28-30 (1911). 45 footnotes.
- "Methyl chloride." Ind.-Cat. S. G. O., 1st ser., 9: 223 (1888); 2nd ser., 10: 781 (1905). 21 references.
- METHYL ETHYL KETONE**
- THIELE, ALBRECHT. Methylethylketon. *In* Abderhalden, Biochem. Handl. 1: 797-799 (1911). 45 footnotes.
- METHYL GLYOXAL**
- MEYER-JACOBSON. Methylglyoxal. *In their* Lehrb. org. Chem. 1, pt. 2: 855-857 (1913). Bibl. footnotes.
- METHYL IODIDE**
- BAUM, FRITZ. Methyljodid. *In* Abderhalden, Biochem. Handl. 1: 43-44 (1911). 50 references.
- METHYL PROPYL KETONE**
- THIELE, ALBRECHT. Methylpropylketon. *In* Abderhalden, Biochem. Handl. 1: 799-800 (1911). 35 footnotes.
- METHYL SALICYLATE**
- KREMERS, E., and JAMES, M. M. On the occurrence of methyl salicylate. *Pharm. Rev.* 16: 100-108 (1898). 22 footnotes. Occurrence in plants.
- METHYLENE CHLORIDE**
- "Methylene chloride." Ind.-Cat. S. G. O., 1st ser., 9: 223-224 (1888); 2nd ser., 10: 783 (1905).
- METHYLENE BLUE**
- "Methylene blue." Ind.-Cat. S. G. O., 2nd ser., 10: 783-784 (1905).
- MEYER-JACOBSON. Methylenblau. *In their* Lehrb. org. Chem. 2, pt. 3: 1496-1500 (1920).
- METHYLQUINOLINES**
- MEYER-JACOBSON. Methylhomologe des Chinolins. *In their* Lehrb. org. Chem. 2, pt. 3: 939 (1920). 95 references.
- METRIC SYSTEM**
- DRURY, AUBREY. World metric standardization. San Francisco, World metric stand. council, 1922. 524 p. Bibl., p. 439-495.
- HILDEBRAND, C. Metric literature clues. San Francisco, World Trade Club, 1920. 64 p. "List of references to books, pamphlets, documents and magazine articles on standardization of weights and measures."
- MEYER, H. H. B. The metric system. *Special Libraries* 13: 1-16 (1922). 350 references.
- NATIONAL INDUSTRIAL CONFERENCE BOARD. The metric versus the English system of weight and measures. New York, Century, 1921. 261 p. Bibl., p. 252-254.
- MICA**
- CARNEGIE LIBRARY OF PITTSBURGH. Mica. *In its* Mo. Bull. 13: 530-542 (1908).
- CIRKEL, FRITZ. Mica, its occurrence, exploitation and uses. Canada, Dept. Mines, Mines Br., 1905. 148 p. Bibl., p. 131-132. 21 references.
- DOELTER, C. Biotit (Magnesiumkaliumglimmer). *In his* Handb. Mineralchem. 2, pt. 2: 680-736 (1917). Bibl. footnotes.
- GT. BRIT. Imperial Mineral Resources Bureau. The mineral industry of the British Empire and foreign countries. War period. Mica. (1913-1919.) London, 1922. 32 p. Bibl., p. 30-32.
- LEWIS, J. VOLNEY. Mica. *Mineral Ind.* 25: 508 (1916); 29: 450-457 (1920). 12 references.
- SCHALLER, W. T. Mica in 1918. U. S. Geol. Sur., Mineral Resources, 1918, pt. 2: 693-694. 36 references.
- SCHMID, HUGH S. DE. Mica, its occurrence, exploitation and uses. 2nd ed. (of Cirkel). Canada, Dept. Mines, Mines Br., No. 118, 1912. 411 p. Bibl., p. 391-398. 129 references.

MICA—Cont'd

STERRETT, D. B. Mica deposits of the United States. U. S. Geol. Sur., Bull. No. 740, 1923. 354 p. Bibl., p. 1-3. 55 references

STERRETT, D. B. Mica. U. S. Geol. Sur., Mineral Resources 1912, pt. 2: 1089-1091. 55 references.

MICHLER'S HYDROL

RUDERMAN, AARON. Some new condensations with *p*, *p*-bis-(dimethyl-amino)-benzhydrol (Michler's hydrol). Thesis, Columbia Univ., 1922. 14 p. Bibl., 2 p. at end.

See also INTERMEDIATES.

MICROCHEMISTRY. See ANALYTICAL CHEMISTRY; BOTANICAL CHEMISTRY.**MICROSCOPY**

CHAMOT, EMILE M. Elementary chemical microscopy. 2nd ed. New York, Wiley, 1921. 479 p. Bibl., p. 463-465.

HADFIELD, ROBERT. Bibliography of the chief literature relating to micrography. Trans. Faraday Soc. 16: 30-36 (1920-1921). Chronological.

WALLIS, THOMAS E. Analytical microscopy, its aims and methods. London, Arnold, 1923. 149 p. Bibl., p. 139-143.

WINTON, ANDREW L. The microscopy of vegetable foods with special reference to the detection of adulteration and the diagnosis of mixtures. 2nd ed. New York, Wiley, 1916. 701 p. Bibl., p. 671-674. Special bibl. for each food.

MIGRATION VELOCITY

JONES, H. C., and ROUILLER, C. A. Relative migration velocities of the ions of silver nitrate. Am. Chem. J. 36: 427-487 (1906). 80 references.

MILK

AIKMAN, CHARLES M. Milk, its nature and composition; a handbook on the chemistry and bacteriology of milk, butter and cheese. 3rd ed. London, Black, 1909. 180 p. Bibl., p. 175-176.

BETTERLIN, JEAN. Le lait sec, son emploi chez le nourrisson malade. Paris, Vigot, 1922. 48 p. Bibl., p. 46-48.

CLAYTON, WM. Colloid problems in dairy chemistry. In Second report on colloid chemistry, 1918, p. 96-117. Bibl. through text.

FLEISCHMANN, W. Lehrbuch der Milchwirtschaft. Berlin, Parey, 1915. 597 p. Bibl. footnotes.

HARVEY, ELLERY H. Bibliography of United States patents relating to milk. Am. Food J. 19: 287-288 (1924). Covers 1908-1923. Classified.

HEINEMAN, P. G. Milk. Philadelphia, Saunders, 1919. 624 p. Bibl. at end of chapters.

HUYGE, C. Index bibliographique des travaux parus sur le lait et les produits laitiers pendant l'année 1912. Ann. Sta. Agron. Etat. Gembloux 2: 253-352 (1913). 757 references. Author index.

KASTLE, JOSEPH H. The chemistry of milk. U. S. Hyg. Lab., Bull. No. 56, 1912, p. 315-425. Composition and general characteristics, 80 references; action of heat and acids, 70 references; action of milk enzymes, 50 references; action of digestive ferments, 40 references; action of bacteria, 36 references; milk poisoning, 24 references; milk standards and adulterations, 80 references.

KIRCHNER, WILHELM. Handbuch der Milchwirtschaft auf wissenschaftlicher und praktischer Grundlage. 7th ed. Berlin, Parey, 1922. 579 p. Bibl. footnotes.

KOBER, G. M. Milk in relation to public health. U. S. 57th Congr., 1st Session, Senate Doc. 441. 235 p.

"Milk." Ind.-Cat. S. G. O., 1st ser., 9: 291-306 (1888); 2nd ser., 10: 857-882 (1905).

RAUDNITZ, R. W. Bestandteile, Eigenschaften und Veränderungen der Milch. Ergeb. Physiol. 2: 193-207 (1903). 669 references.

RIEVEL, HEINRICH. Handbuch der Milchkunde. 2nd ed. Hannover, Schaper, 1910. 463 p. Bibl., p. 436-448.

ROTHSCHILD, HENRI J. N. C. DE. Bibliographia lactaria; bibliographie générale des travaux parus sur le lait et sur l'allaitement jusqu'en 1899. Paris, Doin, 1901. 584 p. 8375 titles, arranged chronologically under subjects with author index; list of patents. Premier supplément, 1901. 98 p. 1324 references. Deuxieme supplément, 1902. 106 p. 1578 references.

SIEGFELD, M. Die Chemie der Milch und der Molkereiprodukte. Chem.-Ztg. 30: 469-472 (1906); 102 footnotes. 31: 701-703, 714-715 (1907); 126 footnotes. 32: 673-675, 686-688 (1908); 154 footnotes. 33: 865, 869, 878 (1909); 177 footnotes. 34: 617-619, 628-630 (1910); 150 footnotes. 35: 969-971, 986-987 (1911); 155 footnotes. 36: 1369, 1378, 1394 (1912); 153 footnotes.

SOMMERFELD, P., et al. Handbuch der Milchkunde. Wiesbaden, 1909. 999 p.

VANDELDE, A. J. J. Recherches sur la proteolyse du lait de vache. Bull.

- soc. chim. Belg. 21: 434-458 (1907).
Bibl. footnotes.
- WEIGMANN, H. Fortschritte der Wissenschaften und der Technik auf dem Gebiet der Einengung und Verarbeitung der Milch. Chem.-Ztg. 24: 1035-1039, 1051-1055 (1900); 235 footnotes. 25: 1073-1080 (1901); 224 footnotes. 26: 593-597 (1902); 167 footnotes. 27: 383-390 (1903); 252 footnotes. 28: 229-232 (1904); 128 footnotes. 29: 408-411 (1905); 145 footnotes.
- See also BUTTER, CHEESE, DAIRY PRODUCTS, FOODS, KUMISS.
- MILK: Analysis and Inspection.**
- AMERICAN PUBLIC HEALTH ASSOCIATION. Laboratory section. Standard methods of milk analysis, bacteriological and chemical. 4th ed. Boston, Am. Public Health Assoc., 1923. 40 p. Bibl., p. 24-25.
- BAUER, J. Die Methodik der biologischen Milchuntersuchungen. Stuttgart, Enke, 1913. 112 p. Bibl. footnotes.
- HILDEBRANDT, ALFRED. Die Verfahren zur Unterscheidung roher von gekochter Milch. Ein Beitrag zur Kenntniss der Peroxydasereaktionen der Kuhmilch. Landw. Jahrb. 50: 299-301 (1916).
- HORTVET, JULIUS. Cryoscopy of milk. J. Ind. Eng. Chem. 13: 198-208 (1921). 51 footnotes.
- MARTIN, EDWARD W. (Bibliography on milk; analysis, composition and adulteration.) In New York State Dairy Commission, 2nd Annual Rept. (Senate Doc., No. 24), p. 122-135. Classified.
- MULLIE, G. [Comparative tests of different methods of distinguishing raw and heated milks.] Rev. gen. Lait 2: 77-86, 100-108, 128-133 (1902); 3: 149-152, 178-182, 200-209 (1903).
- RACE, JOSEPH. The examination of milk for public health purposes. New York, Wiley, 1918. 224 p. Bibl. at end of chapters.
- RAMMSLEDT, O. Kochprobe, Alkoholprobe und Säuregrad der Milch. Z. oeffent. Chem. 17: 441-455, 467-471 (1911). 56 footnotes.
- SPLITTBERGER, A. Ueber die Bestimmung der Trockensubstanz der Milch. Z. Nahr.-Genussm. 22: 583-599 (1911). 50 footnotes.
- TILLMANS, J. Ueber der Nachweis und die quantitative Bestimmung von Salpetersäure in der Milch mit Diphenylamin-Schwefelsäure. Z. Nahr.-Genussm. 20: 676-707 (1910). 40 footnotes.
- TROMSDORFF, R. [On the reducing properties of milk and the Schar-dinger reaction.] Centbl. Bakt. I Abt., Orig., 49: 291-301 (1909).
- WEBER, EWALD. Die zur Unterscheidung roher und gekochter Milch dienenden Untersuchungsmethoden und ihre Verwendbarkeit im Dienste der Veterinär- und Sanitätspolizei. Dissertation, Leipzig, 1902. 136 p. Bibl., p. 131-136.
- WILCOX, E. V. Production and inspection of milk. Hawaii Agr. Expt. Sta. (Special Pub.), 1912. 348 p. Bibl., p. 316-343.
- See also URINE (Neuberg).
- MILK: Bacteriology.**
- HAMMERSCHMIDT, JOHANN. Gegenwärtiger Stand der Forschung ueber die Bakteriologie der Milch, 1912-1922. Zentr. ges. Hyg. 5: 367-371 (1923-1924). 341 references.
- MILK: Coagulation.**
- BRÄULER, RICHARD. Der Einfluss verschiedener Labmengen und verschiedener Temperaturen auf die Gerinnung der Milch und auf die mikroskopische Struktur der Kasein- und Fibringerinnung. Arch. ges. Physiol. 133: 519-551 (1910). Bibl. footnotes.
- FULD, E. Ueber Milchgerinnung durch Lab. Ergeb. Physiol. 1: 468-472 (1902). 114 references.
- LAQUER, E. Ueber die Wirkung der Labfermente auf Milch und Kasein. Biochem. Centr. 4: 333-347 (1905). 122 references.
- SCHLOSSMANN, A., and ENGEL, ST. Milchgerinnung. In Oppenheimer, Handb. Biochem. 3, pt. 1: 405-432 (1910). 59 footnotes.
- MILK: Composition.**
- CLOTHIER, R. W. Seasonal variation in butter fat content of milk in Southern Arizona. Proc. Soc. Prom. Agr. Sci. 39: 75-112 (1919). 100 references.
- WARDLAW, H. S. R. On the composition of human milk in Australia. The composition during the early stages of lactation. J. and Proc. Roy. Soc. New South Wales 49: 169-198 (1915).
- ZAGARRIO, V. [Chemical composition of milk.] Gior. R. Soc. Naz. Vet. 61: 432-442, 450-457 (1912). Bibl. of Italian work.
- See also MILK.
- MILK: Condensed.**
- COUTTS, F. J. H. Condensed milks, with special reference to their use as infants' foods. Reports Local Government Board (Gt. Brit), Pub. Health and Med. Subjects, n. s., No. 56, 1911. 64 p.

MILK: Condensed—Cont'd

SIDLER, FRANZ. Untersuchungen ueber die gebräuchlichsten, in der Schweiz Fabrikmäßig hergestellten Milchpräparate pasteurisierte, sterilisierte und kondensierte Milch, mit besonderer Berücksichtigung der chemischen Zusammensetzung, des Keimgehaltes, der Gerinnungsfähigkeit und Verdaulichkeit "in vitro." Dissertation, Zürich, 1903. 88 p. Bibl., p. 85-88. Also in Arch. Hyg., 47: No. 4.

VIALE, G., and RABBENO, A. [Analytical researches on the ageing of condensed milk.] Biochim. e terapia sper. 8: 324-352 (1921). 43 references.

MILK: Dried.

BITTERLIN, JEAN. Le lait sec, son emploi chez le nourrisson malade. Paris, Vigot, 1922. 48 p. Bibl., p. 46-48.

CAZALAS, XEVIER. Le lait desséché; étude de son emploi dans l'alimentation de la première enfance. Paris, Asselin, 1912. 168 p. Bibl., p. 163-166.

CLARK, T., and COLLINS, S. D. Dried milk powder in infant feeding. Pub. Health Repts. 37: 2415-2433 (1922). Reprint No. 789. 20 p. Bibl., p. 19-20.

COUTTS, F. J. H. Dried milks, with special reference to their use in infant feeding. Repts. Local Government Board (Gt. Brit.), Pub. Health and Med. Subjects, n. s., No. 116, 1918. 138 p.

MILK: Fermented.

HARRISON, F. C. [Bitter milk and cheese.] Rev. gen. lait 1: 457-469, 485-499 (1902).

HOHEDANEL, M. [Studies of youghourt, with special reference to dried preparations.] Arch. Hyg. 78: 193-217 (1913).

KUNTZE, W. [Studies on fermented milk. I. Youghourt and matzoon. II. Kefir.] Centbl. Bakt. II Abt., 21: 737-768 (1908); 24: 101-122 (1909).

ROGERS, L. A. Fermented milks. U. S. Dept. Agr., Bur. Animal Ind., Circ. No. 171, 1909. Annual Report, 1909, p. 133-161. 76 references, p. 156-161.

ROGERS, L. A. Fermented milks. U. S. Dept. Agr., Bull. No. 319, 1916. 30 p. Bibl., p. 25-30. 82 references.

WEIGMANN, H. Die Gärung der Milch und der Abbau ihrer Bestandteile. In Lafar, Hand. tech. Mykologie 2: 48-189 (1905-1908). Bibl. through text.

See also KOUMISS.

MILK: Food value.

CARSTARPHEN, W. T. Some physiologic and biochemic observations on milk. Va. Med. Semi-Mo. 20: 319-326 (1915).

HAMBURG. Allgemeine Ausstellung für hygienische Milchversorgung. Wissenschaftliche Abteilung. Die Milch und ihre Bedeutung für Volkswirtschaft und Volksgesundheit. Hamburg, Boysen, 1903. 522 p. Contains bibls.

LANE-CLAYTON, JANET C. Report to the local government board upon the available data in regard to the value of boiled milk as a food for infants and young animals. Repts. Local Government Board (Gt. Brit.), Pub. Health Med. Subjects, n. s., No. 63, 1912. 60 p. Ergeb. innere Medizin 10: 635-637 (1913). 67 references.

MATTILL, H. A., and CONKLIN, RUTH E. Nutritive properties of milk. J. Biol. Chem. 44: 137 (1920). 42 references.

OHLY, C. H. Milchdiät und Milchkur, mit einer Anleitung zur ihrer methodischen Ausübung. Freiburg. Speyer, 1913. 151 p. Bibl., p. 141-151.

PIROCCHI, A. [Skim milk as a feeding stuff for calves.] Ann. Ist Agr. (Milan), 6: 123-189 (1901-1905).

ROSE, FLORA. Milk: a cheap food. Cornell Reading Course for Farm Homes, No. 3, 75-85 (1917).

SCHRAPE, WILHELM J. Experimentelle Beiträge zur Ernährung tierischer Säuglinge mit arteigener und artfremder Milch. Dissertation, Leipzig, 1912. 83 p. Bibl., p. 77-82. 87 references.

WASHBURN, R. M., and JONES, C. H. Studies of the values of different grades of milk in infant feeding. Vt. Agr. Expt. Sta., Bull. No. 195, 1916. 134 p. 60 references on p. 119-120.

MILK: Pasteurization and sterilization.

AYERS, SAMUEL H. The present status of the pasteurization of milk. U. S. Dept. Agr., Bull. No. 342, 1922. 27 p. Bibl., p. 25-27.

BANDINI, P. [The action of formalin and hydrogen peroxide in milk.] Centbl. Bakt. I Abt., Orig., 41: 271-279; 379-386 (1906).

HUYGE, C. The sterilization of milk by ultraviolet rays. Ann. Sta. Agron. Gembloux, 1912: 201-214. 61 references.

MOORE, A. V. The pasteurization of skim milk and whey as food for calves. N. Y. Dept. Agr., Bull. No. 81: 1780-1797. 1916.

ROTHSCHILD, H. DE. Pasteurisation et stérilisation du lait. Paris, Doin, 1901. 91 p.

MILK: Physiological.

BARDELLI, C. Contribution to the study of the germicidal power of milk. *Hyg. Viande et Lait* 3: 249-265 (1909).

BASCH, K. Die Physiologie der Milch-absonderung. *Ergeb. Physiol.* 2: 326-334 (1903). 237 references.

LANE-CLAYTON, JANET E. "Biological properties" of milk, both of the human species, and of cows, considered in special relation to the feeding of infants. *Repts. Local Government Board (Gt. Brit.), Pub. Health. Med. Subjects, n. s., No. 76*, 1913. 95 p.

LANE-CLAYTON, J. E. Milk and its hygienic relations. London, Longmans, 1916. 348 p. Bibl. at end of chapters.

MEIGS, E. B. Milk secretion in relation to diet. *Physiol. Rev.* 2: 204-237 (1922). 105 references.

VÖLTZ, WL. Milchrüse und Milchsekretion. Vergleichende Chemie der Milch. In Oppenheimer, *Handb. Biochem.* 3, pt. 1: 382-404 (1910). 169 footnotes.

MILK SUPPLY

ERDMANN, HENRY E. The marketing of whole milk. New York, Macmillan, 1921. 333 p. Bibl., p. 317-322.

GOOREN, G. L. J. [Investigation of market milk.] *Centbl. Bakt., II Abt.*, 35: 625-646 (1912).

KELLY, ERNEST, and CLEMENT, C. E. Market milk. New York, Wiley, 1923. 445 p. Bibl. at end of chapters.

MEYER, H. H. B. List of references on the milk industry. *Special Libraries* 8: 10-22 (1917). 400 references.

"Milk supply." *Ind.-Cat. S. G. O.*, 2nd ser., 10: 883-890 (1905).

WAELE, H. DE, SUGG, E., and VANDELDE, A. J. J. [Obtaining raw sterile milk.] *Centbl. Bakt., II Abt.*, 13: 30-35 (1904).

MINE GASES

DARTON, N. H. Occurrence of explosive gases in coal mines. *U. S. Bur. Mines, Bull. No. 72*, 1915. Bibl., p. 233-237.

MINERAL ACIDS. See ACIDS, ALKALIS AND SALTS.

MINERAL METABOLISM. See METABOLISM.

MINERAL OILS. See PETROLEUM.

MINERAL PAINTS

D'ANS, J., and WAESER, B. Verschiedene Mineralfarben. In Brauer and d'Ans, *Fortschritte*, 1: 3635-3637 (1923). German patents.

HILL, JAMES M. Mineral paints, pigments and vehicles. *U. S. Geol. Sur., Mineral Resources*, 1913, pt. 2: 67-70; 117 references, 1901-1914. 1914, pt. 2: 117-122; 33 references, 1914-1915.

PHALEN, W. C. Mineral paints. *U. S. Geol. Sur., Mineral Resources*, 1911, pt. 2: 898-993. 148 references, 1903-1912.

ROSE, FRIEDRICH. Die Mineralfarben und die durch Mineralstoffe erzeugten Färbungen. Leipzig, Spamer, 1916. 395 p. Bibl. footnotes.

WASER, BRUNO. Fortschritte in der Industrie der Erdfarben, 1905-1913. *Chem.-Ztg.* 38: 1029, 1058, 1075 (1914). Bibl. footnotes.

MINERAL RESOURCES

GREAT BRITAIN. Patent Office. Subject list of works on mineral industries in the library of the patent office. London, 1912. 3 pts.

MCCASKEY, H. D., and BURCHARD, E. F. Our mineral supplies. *U. S. Geol. Sur., Bull. No. 666*, 1919. 278 p. Bibl., p. 221-278. About 3000 references, 1885-1918.

NICKLES, JOHN M. Geologic literature on North America, 1785-1918. *U. S. Geol. Sur., Bull. No. 746*, 747. 1923-1924. 2 vols., part 1 being the bibl., part 2 the index. Includes material found in *Bulletins* 127, 188, 189, 301, 372, 409, 444, 495, 524, 545, 584, 617, 645, 665, 684, 698 and much additional.

NICKLES, JOHN M. Bibliography of North American geology for 1919. *U. S. Geol. Sur., Bull. No. 731*, 1922. 282 p. 2108 references. No. 758, 1924. 273 p. 2241 references.

See also names of the various minerals.

MINERAL WATERS. See WATER.

MINERALOGY

AHLANDER, FR. E. [Catalog of Swedish geological, paleontological, petrographic and mineralogical literature.] *Geol. För. Förh.* 23: 185-198 (1901); 231 entries. 25: 432-448 (1903); 293 entries. 29: 49-67 (1907); 271 entries. 41: 539-606 (1919); 1036 entries. 42: 453-464 (1920); 193 entries. 43: 663-668 (1921); 74 entries. 44: 777-782 (1922); 110 references. 45: 598-605 (1923); 137 entries. Some of these are of chemical interest.

MINERALOGY—Cont'd

ANDERSON, C. Bibliography of Australian mineralogy. New South Wales, Geol. Sur., Mineral Resources, No. 22, 1916. 164 p.

BRUGGEN, J. Bibliography of Chilean geology and mineralogy. Bol. minero sociedad nacional mineria (Chile) (3) 31: 441-513, 539-593 (1919). 1350 titles.

DANA, JAMES D. The system of mineralogy. Descriptive mineralogy. 1870. Bibl., p. xxxv-xlv. 1st suppl., 1899, p. v-vi. 2nd suppl., 1909, p. v-vi.

DOELTER, C. Handbuch der Mineralchemie. Dresden, Steinkopf, 1912-1921. 3 vols. Extensive bibl. footnotes.

EAKLE, ARTHUR S. Minerals of California. Calif. State Mining Bur., Bull. No. 91. 328 p. Bibl., p. 306-321.

GORDON, SAMUEL G. The mineralogy of Pennsylvania. Acad. Nat. Sci. Philadelphia, Special Pub. No. 1, 1922. 255 p. Bibl., p. 240-255.

GOSSNER, B. Mineralogische und geologische Chemie. Fortschritte Chem. 1: 93-95, 145-153 (1909); 2: 229-241 (1910); 4: 53-63 (1911); 7: 221-233 (1913); 9: 233-248 (1914); 11: 107-118 (1914-1915); 13: 97-105 (1917-1918); 15: 139-163 (1919-1920). References through text.

HAMILTON, S. H., and WITHROW, J. R. Progress of mineralogy in 1898. Bull. Am. Inst. Mining Eng. 1: 1-30 (1899).

LACROIX, ALFRED. La mineralogie. La science Française, vol. 1. Paris, 1915. Bibl., p. 185-200. 224 references.

MARC, R., and HIMMELBAUER, —. Die Bedeutung der Kolloidchemie für die Mineralogie. Fortschr. Mineral. Krist. 3: 11-62 (1913). 127 references.

MOSES, A. J., and PARSONS, C. L. Elements of mineralogy, crystallography and blowpipe analysis from a practical standpoint. 5th ed. New York, 1916. 631 p. Bibl., p. xi-xiii. 74 references.

PENFIELD, S. L., and PIRSSON, L. V. Contributions to mineralogy and petrography from the laboratories of the Scheffeld scientific school of Yale University. New York, 1901. 482 p. Bibl., p. 9-21, 384-386. 275 references.

SCOTT, ALEX. The application of colloid chemistry to mineralogy and petrology. In Fourth report on colloid chemistry, 1922, p. 204-243. 485 references.

SMITHSONIAN INSTITUTION. Mineralogy. In its Annual Report 1880: 290-312; 1882: 533-549; 1883: 661-679; 1884: 543-561; 1885: 687-712; 1887: 449-476; 1888: 455-473. Contains bibls.

Serial

American mineralogist. 1916- . Abstracts all literature on the subject. Mineralogical abstracts, 1921- . Published with Mineralogical magazine. Classified.

MINERALS

BRUHNS, WILLY. Die nutzbaren Mineralien und Gebirgsarten im Deutschen Reiche. Berlin, Reimer, 1906. 859 p. Bibl., p. 71-760.

CASTELLO, WALTER O. The commercial minerals of California, with notes on their uses, distribution, properties, ores, field tests and preparation for the market. Calif. State Mining Bur., Bull. No. 87, 1920. 124 p. Bibl., p. 110-115.

FRECHETT, HOWELLS. Report on the non-metallic minerals used in the Canadian manufacturing industries. Canada, Dept. Mines, Mines Br., 1914. 199 p. Bibl., p. 137-149.

MERRILL, G. P. The non-metallic minerals. Their occurrence and uses. New York, 1904. 414 p. Bibl. through text.

NIGGLI, PAUL. Neuere Mineralsynthesen. Fortschr. Mineral. Geol. 5: 167-172 (1916); 6: 64-66 (1920). 243 references.

RATEL, C. Bibliographie mondiale moderne des matériaux et minerais. Paris, Bureau d'organisation économique, 1920. 350 p.

SCHNEIDERHÖHN, HANS. Die mikroskopische Untersuchungen undurchsichtiger Mineralien und Erze im auffallenden Licht und ihre Bedeutung für Mineralogie und Lagerstättenkunde. Neues Jahrb. Mineral., Geol. 43: 404-410 (1919-1920). 86 references.

MINERALS: Color.

HERMANN, WALTER. Ueber die Einwirkung oxydierender und reduzierender Gase auf die Färbung einiger Minerale. Z. anorg. Chem. 60: 369-404 (1908). Bibl. footnotes.

MINERALS: Melting points.

LANDOLT-BÖRNSTEIN. Schmelz- und Umwandlungspunkte einiger natürlichen und künstlichen Minerale. In their Tabellen, 4th ed., 1912, p. 702-703; 5th ed., 1923, p. 501-503.

See also MELTING POINTS (Day).

MINERALS: Thermal expansion.

SCHULZ, K. Die Koeffizienten der thermischen Ausdehnung der Min-

eralien und Gesteine und der künstlich hergestellten Stoffe von entsprechender Zusammensetzung. Fortschr. Mineral. Geol. 4: 337-384 (1914); 5: 293-324 (1916); 6: 137-206 (1920); 7: 327-426 (1922). 313 references through text. Index by author and subject.

MIXED ACIDS

WORDEN, E. C. Mixed acids. In *his* Technology of cellulose esters 1: 1403-1518 (1921). 9376 references, including patents.

See also NITRIC ACID, SULFURIC ACID.

MOISSANITE. See SILICON CARBIDE.

MOLASSES

DAUDE, —. [Desugaring molasses by precipitating calcium sucrate.] Z. Ver. Zuckerind. 65: 617-640 (1915). Patents.

SCHMOEGER, M. [Beet diffusion residue and molasses.] Landw. Vers. Stat. 59: 83-155 (1903).

U. S. Bureau of Standards. Summary of technical methods for the utilization of molasses, collated from patent literature. Circular No. 145, 1924. 72 p.

WEST, CLARENCE J. Molasses. Bibliographic Series, A. D. Little, Inc., No. 5, 1920. 52 p. Classified.

MOLDING SANDS

ECKEL, EDWIN C. Molding sand—its use, properties and occurrence. N. Y. State Mus., 55th Ann. Rept., r91-95 (1905). 6 references.

NATIONAL RESEARCH COUNCIL—Division of Engineering. Summary of published work on natural and synthetic foundry sands and clays and employment of greater proportions of used sands in molding and core making operations. New York (1921?). 65 p., mimeographed. Contains bibls.

MOLECULAR ASSOCIATION

TURNER, W. E. S. Molecular association. New York, Longmans, 1915. 170 p. 275 references.

MOLECULAR REARRANGEMENTS

GILLET, ALF. Transpositions en milieu acide dans les composés non saturés. Bull. soc. chim. Belg. 30: 138-153, 226-252 (1921). Bibl. footnotes.

STIEGLITZ, J., and LEECH, P. M. Molecular rearrangement of triarylmethylhydroxylamines and the "Beckmann" rearrangement of ketoximes. J. Am. Chem. Soc. 36: 272-301 (1914). 50 footnotes.

STIEGLITZ, J., and STAGNER, B. A. Molecular rearrangement of β -triphenylmethyl- β -methylhydroxylamine. J. Am. Chem. Soc. 38: 2046-2068 (1916). Bibl. footnotes.

See also BECKMANN REARRANGEMENT.

MOLECULAR VOLUME

LE BAS, GERVAISE. The molecular volume of liquid chemical compounds from the point of view of Kopp. New York, Longmans, 1915. Bibl., p. 273-275.

MOLECULAR WEIGHTS

FRIEND, J. N. Molecular weights. In *his* Textbook, 1: 128-158 (1914). Bibl. footnotes.

RÜGHEIMER, L., and RUDOLFI, E. Das Molekulargewicht der Metallchloride. Ann. 339: 311-349 (1905). 62 footnotes.

MOLYBDENUM

GR. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Molybdenum. (1913-1919.) London, 1923. 87 p. Bibl., p. 80-87.

HALEN, S. Die Verwendung des Molybdäns und seiner Verbindungen. Edel-Erden u. -Erze 1: 157-161 (1920). References through text.

HORTON, FREDERICK W. Molybdenum: its ores and their concentration, with a discussion of markets, prices and uses. U. S. Bur. Mines, Bull. No. 111, 1916. 132 p. Bibl., p. 121-125. 87 references, 1894-1916.

JANDER, G. Kolloidchemie des Molybdäns. In Abegg, Handb. anorg. Chem. 4, pt. 1, 2nd half: 701 (1909). 22 references.

KIESER, A. J. Molybdän. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 875-1043, 1446-1529 (1912). References through text.

KOPPEL, I. Molybdän. In Abegg, Handb. anorg. Chem. 4, pt. 1, 2nd half: 674-686 (1919). 472 references (1790-1919).

PARMENTIER, F. Molybdène. In Frémy, Enc. chim. 3, 8^e cahier: 68 (1886).

PICHARD, —. Molybdène. In Moissan, Chim. min., 4: 685-758 (1905). 392 footnotes.

RASTALL, ROBERT H. Molybdenum ores. London, Murray, 1922. 86 p. (Imperial Inst. Mon.) Bibl., p. 78-86.

WALKER, T. L. Report on the molybdenum ores of Canada. Canada, Dept. Mines, Mines Br., No. 93, 1911. 58 p.

WILSON, ALFRED W. G. Molybdenum. Mineral Ind. 25: 509-518 (1916); 26: 454-467 (1917); 27: 490-497 (1918); 28: 475 (1919). Bibl. footnotes.

WORCESTER, P. G. Molybdenum deposits of Colorado with general notes on the molybdenum industry. Colo. Geol. Sur., Bull. No. 14, 1919, 131 p. Bibl., p. 120-123. 65 titles.

MOLYBDENUM: Analytical.

BONARDI, J. P. Bibliography on the qualitative and quantitative chemistry of molybdenum. U. S. Bur. Mines, Bull. No. 212, p. 125-130 (1923). 115 references.

BONARDI, J. P., and BARRETT, E. P. Determination of molybdenum. U. S. Bur. Mines, Tech. Paper No. 230, 1920. Bibl., p. 31-32. 57 references.

CROOK, W. J., and M. L. A. Determination of molybdenum in ores. Mining Sci. Press 117: 313-314 (1918).

KIESER, A. J. Molybdän-Analytisches. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 885-888, 1451-1452 (1912).

MOLYBDENUM OXIDES

KIESER, A. J. Molybdän und Sauerstoff. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 889-909 (1912).

MONAZITE

BOWMAN, H. L. Beiträge zur Kenntniss des Monazit. Z. Krystal. 33: 125-126 (1900). 56 references.

DOELTER, C. Monazit. In his Handb. Mineralchem. 3, pt. 1: 546-559 (1918). Bibl. footnotes.

GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Monazite. (1913-1919.) London, 1920. 15 p. Bibl., p. 12-14.

JOHNSTONE, SYDNEY J. Monazite. Mineral Ind. 26: 468-473 (1917); 29: 469-477 (1920). 17 references.

KITHIL, KARL L. Monazite, thorium and mesothorium. U. S. Bur. Mines, Tech. Paper No. 110, 1915. 31 p. Bibl., p. 30. 23 references.

NITZE, HENRY B. C. Monazite and monazite deposits in North Carolina. N. C. Geol. Sur., Bull. No. 9, 1895. 47 p. Bibl., p. 38-43.

STERRETT, D. B. Monazite and zircon. U. S. Geol. Sur., Mineral Resources 1911, pt. 2: 1196. 22 references, 1888-1910.

See also THORIUM.

MORDANTS

BANCROFT, W. D. Mordants. J. Phys. Chem. 26: 447-470, 502-536, 736-772 (1922). Bibl. footnotes.

RHEINBOLD, H., and WEDEKIND, E. Ueber die Bindung organischer Farbstoffe durch anorganische Substrate. Kolloidchem. Beihefte 17: 115-188 (1923). Bibl. footnotes.

See also DYES AND DYEING.

MORINDINE

OESTERLE, O. A., and TISZA, ED. Zur Kenntniss des Morindins. Arch.

Pharm. 245: 534-553 (1907). Bibl. footnotes.

MORPHINE

BROWN, HERMAN E. Chemical bibliography of morphine, 1875-1896. Pharm. Rev. 15: 204-226 (1897); Pharm. Arch. 1: 17, 25, 29 (1898). Separate, 1898. 60 p. Annotated. Chronological with author and subject index.

FALTIS, F. [Constitution of morphine.] Arch. Pharm. 255: 85-112 (1917).

GULLAND, JOHN M., and ROBINSON, ROBERT. The morphine group. I. A discussion of the constitutional problem. J. Soc. Chem. 123: 996-998 (1923). Classified by derivatives.

HALLE, WALTER L. Die Entwicklung und der gegenwärtige Stand der Frage nach der Konstitution des Morphins (Kodeins, Thebains). Chem.-Ztg. 29: 1264-1268 (1905). 58 footnotes.

"Morphine." Ind.-Cat. S. G. O., 1st ser., 9: 462-467 (1888); 2nd ser., 11: 92-97 (1906).

SCHMIDT, JULIUS. Morphin. In Abderhalden, Biochem. Handl. 5: 261-270 (1911). 50 footnotes.

See also ALKALOIDS.

MORTAR

CANTZLER, A., and SPLITTGERBER, A. [The mixing proportions of trass and lime.] Zement 12: 57-58, 63-64 (1923). Complete bibl. on trass mortar.

ROHLAND, —. Mörtel. In Abegg, Handb. anorg. Chem. 2, pt. 2: 205-206 (1906). 65 references.

See also LIME, CEMENTS.

MUCIC ACID

MEYER-JACOBSON. Schleimsäure. In their Lehrb. org. Chem. 1, pt. 2: 704-705 (1913).

NEUBERG, C., and REWALD, B. Schleimsäure. In Abderhalden, Biochem. Handl. 2: 506-510 (1911). 60 footnotes.

MUCIN

"Mucin." Ind.-Cat. S. G. O., 2nd ser., 11: 165 (1906). 25 references.

SAMMUELY, FRANZ. Mucine und Mucoide (sog. "Glucoproteide."). In Abderhalden, Biochem. Handl. 4: 137-153 (1911). Bibl. footnotes.

SCHULZ, F. N. Schleimdrüsen und Schleim. In Oppenheimer, Handb. Biochem. 3, pt. 1: 1-6 (1910). 14 footnotes.

MUSCARINE

"Muscarine." Ind.-Cat. S. G. O., 1st ser., 9: 548-549 (1888); 2nd ser., 11: 202 (1906). 28 references.

See also CHOLINE.

MUSCLE

"Chemistry of muscle." Ind.-Cat. S. G. O., 1st ser., 9: 549-551 (1888); 2nd ser., 11: 202-204 (1906).

FREY, M. v. Chemie des Muskels. In Nagel, Handb. der Physiologie des Menschen 4: 464-482 (1909). Bibl. footnotes.

FÜRTH, OTTO v. Chemie des Muskelgewebes. In Oppenheimer, Handb. Biochem. 2, pt. 2: 244-281 (1909). 155 footnotes. 2nd ed., 4: 297-352 (1924). 211 footnotes.

FÜRTH, OTTO v. Ueber chemische Zustandsänderungen des Muskels. *Ergeb. Physiol.* 2: 574-579 (1903). 131 references.

FÜRTH, OTTO v. Zur Gewebschemie des Muskels. *Ergeb. Physiol.* 1: 110-113 (1902). 95 references.

FÜRTH, OTTO v. Die Kolloidchemie des Muskels und ihre Beziehungen zu den Problemen der Kontraktion und der Starre. *Ergeb. Physiol.* 17: 367-376 (1919). About 400 references.

HILL, A. V. Die Beziehungen zwischen der Wärmebildung und den im Muskel stattfindenden chemischen Prozessen. *Ergeb. Physiol.* 15: 431-432 (1916). 59 references.

VERZÁR, FRITZ. Der Gaswechsel des Muskels. *Ergeb. Physiol.* 15: 2-5 (1916). 118 references.

WILSON, D. W. Partition of non-protein water-soluble nitrogen in muscle. *J. Biol. Chem.* 17: 400 (1914). 40 references.

MUSK

"Musk." Ind.-Cat. S. G. O., 1st ser., 9: 592 (1888); 2nd ser., 11: 256 (1906). 50 references.

NOELTING, E. Le musc artificiel. *Chimie & Industrie* 6: 719-736 (1920). Footnotes and bibl., p. 735-736.

MUSTARD GAS

WARTHIN, ALFRED S., and WELLER, C. V. The medical aspects of mustard gas poisoning. St. Louis, Mosby, 1919. 267 p. Bibl., p. 256-264.

See also CHEMICAL WARFARE.

MUSTARD OILS

FUNK, CASIMIR. Schwefelhaltige Verbindungen. In Abderhalden, *Biochem. Handl.* 4: 918-924 (1911). 90 footnotes.

MEYER-JACOBSON. Senföle. In *their* Lehrb. org. Chem. 1, pt. 2: 1315-1320 (1913). Bibl. footnotes.

PETERSON, W. H. Metabolism of the mustard oils. *J. Biol. Chem.* 34: 583 (1918). 14 references.

WEHRMANN, FR., WEGENER, K., BRAUNWARTH, FR. H., and MEYER, K. Bestimmung des Senföls. *Arch. Pharm.* 253: 306-327 (1915). Bibl. footnotes.

MYOSINASE. See ENZYMES.

MYRISTIC ACID

SCHMIDT, E. Myristinsäure. In Abderhalden, *Biochem. Handl.* 1: 999-1003 (1911). 55 footnotes (includes derivatives).

See also ACIDS, ORGANIC.

NAPHTHALENE

BAUM, FRITZ. Naphthalin. In Abderhalden, *Biochem. Handl.* 1: 326-343 (1911). 200 footnotes (includes derivatives).

MEYER-JACOBSON. Naphthalin. In *their* Lehrb. org. Chem. 2, pt. 2: 294-313 (1903). Bibl. footnotes.

"Naphthalene." Ind.-Cat. S. G. O., 1st ser., 9: 626 (1888); 2nd ser., 11: 321 (1906).

REVERDIN, F., and NOELTING, E. Sur la constitution de la naphthaline et ses dérivés. *Bull. soc. ind. Mulhouse*, Dec., 1887. Separate, Mulhouse, Bader, 1888. 76 p. Bibl. footnotes to tables.

REVERDIN, F., and FULDA, H. Tabellarische Übersicht der Naphthalinderivate. Basel, Georg, 1894. 56 p. Based on the preceding work.

TAUBER, ERNST, and NORMAN, R. Die Derivate des Naphthalins. Berlin, Gaertner, 1896. Bibl., p. 183-219. Includes patents.

See also GAS, PURIFICATION.

NAPHTHENES

ASCHAN, OSSIAN. Zur Genese der Naphthene und der Naphthensäuren. *Ann.* 324: 1-39 (1902). 54 footnotes.

WISCHIN, R. A. Die Naphtene und ihre Stellung zu anderen hydrierten cyclischen Kohlenwasserstoffen. Braunschweig, 1901.

See also PETROLEUM (Redwood).

NAPHTHENIC ACIDS. See NAPHTHENES, PETROLEUM (Redwood).**NARCEINE**

"Narceine." Ind.-Cat. S. G. O., 1st ser., 9: 629 (1888); 2nd ser., 11: 324 (1906).

See also ALKALOIDS.

NARCOSIS

HÖBER, RUDOLF. [Physical chemistry of stimulation and narcosis.] *Z. Elektrochem.* 22: 296-301 (1916).

HÖBER, RUDOLF. Die Theorien der Narkose. In *his* Physikalische Chemie der Zelle und der Gewebe, 4th ed., 1914, p. 445-471. Bibl. footnotes.

TRAUBE, J. Theorie der Narkose. *Arch. ges. Physiol.* 153: 276-308

NARCOSIS—Cont'd

(1913); 160: 501-510 (1914-1915).
Bibl. footnotes.

WIECHMANN, ERNST. Zur Theorie der Magnesiumnarkose. *Arch. ges. Physiol.* 182: 74-103 (1920). Bibl. footnotes.

WINTERSTEIN, HANS. Die Narkose in ihrer Bedeutung für die allgemeine Physiologie. Berlin, Springer, 1919. 319 p. Bibl., p. 279-310.

See also ANESTHETICS.

NARCOTICS

GAZENBEEK, LEO. Experimentelle Untersuchungen ueber die narkotische Wirkung von Magnesium Sulfuricum nach subkutaner und intraperitonealer Applikation bei Hund und Kaninchen unter Berücksichtigung der praktischen Verwendbarkeit dieses Mittels als Narkotikum. Dissertation, Bern, 1917. 41 p. Bibl., p. 40-41.

"Narcotics." *Ind.-Cat. S. G. O.*, 1st ser., 9: 629-631 (1888); 2nd ser., 11: 326-327 (1906).

WIEGERT, WILHELM K. A. Ueber die Wirkung von Magnesium Sulfuricum bei subkutaner, intravenöser und intratrachealer Anwendung. Dissertation, Bern, 1909. 39 p. Bibl., p. 37-39.

See also ALKALOIDS, DRUGS, ETC.

NARCOTINE

RABE, PAUL, and McMILLIAN, ANDREW. Ueber Narkotin und Hydrastin. *Ann.* 377: 223-258 (1910). Bibl. footnotes.

See also ALKALOIDS.

NATROLITH. See SODIUM ALUMINIUM SILICATE.**NAVAL STORES**

SCHORGER, A. W. Contribution to the chemistry of American conifers. *Trans. Wis. Acad. Sci. Arts Letters* 19: 728-765 (1919). 60 references.

SCHORGER, A. W., and BETTS, H. S. The naval stores industry. *U. S. Dept. Agr., Bull. No. 229*, 1915. 58 p. Bibl., p. 53-58. 96 references, including patents.

VEITCH, F. P., and GROTLISCH, V. E. Progress in the chemistry of naval stores. *J. Ind. Eng. Chem.* 14: 781-784 (1922). 58 references.

See also RESINS, TURPENTINE, WOOD DISTILLATION.

NEODYMIUM. See RARE EARTHS.**NEON**

BRISCOE, H. VINCENT. Neon. In *Friend, Textbook*, 1: 322-329 (1914). Bibl. footnotes.

See also RARE GASES.

NEOSALVARSAN. See ARSPHENAMINE.**NERVES**

CREMER, M. Chemie der Nerven. In *Nagel, Handb. der Physiologie des Menschen*, 4: 812-817 (1909). Bibl. footnotes.

HALLIBURTON, W. D. Die Biochemie der peripheren Nerven. *Ergeb. Physiol.* 4: 24-26 (1905). 107 references.

PERITZ, GEORG. Biochemie des Zentralnervensystems. In *Oppenheimer, Handb. Biochem.* 2, pt. 2: 282-337 (1909). 179 footnotes.

PERITZ, G. Der Stoffwechsel des Nervensystems. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 8: 91-148 (1924). 151 footnotes.

NEURONAL. See SEDATIVES.**NEURINE. See CHOLINE.****NICKEL**

BROWNE, DAVID H., and THOMPSON, JOHN F. Physical properties of nickel. *Trans. Am. Inst. Mining Met. Eng.* 64: 387-414 (1920). Bibl. footnotes.

COPAUX, H. Nickel. In *Moissan, Chim. min.* 4: 245-296 (1905). 467 footnotes.

DUMAS, M. L. Recherches sur les aciers au nickel à hautes teneurs. Paris, 1902. 208 p. Bibl., p. 202-204. From *Ann. Mines* (10) 1: 357-561 (1902). Bibl., 553-555.

FRIEND, J. NEWTON. Nickel. In *his Textbook*, 9, pt. 1: 78-135 (1920). Bibl. footnotes.

GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Nickel. (1913-1919). London, 1922. 56 p. Bibl., p. 46-55.

GUTBIER, A. Nickel. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 1: 1-189, 1385-1440 (1909). References through text.

HAMMOND, L. D. The electrodeposition of nickel. *Trans. Am. Electrochem. Soc.* 30: 103-134 (1917). 50 references.

MERICA, PAUL D. Physical properties of nickel. *Chem. Met. Eng.* 24: 73-76 (1921). 35 references through text.

MEUNIER, M. J. Nickel. In *Frémy, Enc. chim.* 3, 12^e cahier: 273-280 (1889).

MOISSAN, HENRI. Le nickel. Paris, Gauthier, 1896. 183 p. Bibl., p. 175-178.

ROYAL ONTARIO NICKEL COMMISSION. Report . . . with appendix. Toronto, 1917. 584+219 p. Bibl., p. 529-584. 755 references. 1803-1917.

RUMBOLD, W. G. Nickel ores. London, Murray, 1923. 81 p. Bibl., p. 75-81. U. S. Bureau of Standards. Nickel. 2nd ed. Circular No. 100, 1924. 162 p. Bibl., p. 132-162. 1317 references, classified.

WATTS, OLIVER P. The electrodeposition of cobalt and nickel. Trans. Am. Electrochem. Soc. 23: 150-152 (1913). 100 references.

NICKEL: Analysis.

SOULE, BYRON A. α -Furildioxime as a reagent for the detection and determination of nickel. The determination of nickel in steel by means of α -furildioxime. Thesis, Univ. of Michigan, 1924. 28 p. Bibl., p. 27-28.

See also COBALT.

NICKEL CARBONYL

ARMIT, H. W. Toxicity of nickel carbonyl. J. Hyg. 7: 550-551 (1907).

GUTBIER, A. Nickelcarbonyl. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 104-108 (1909).

MITTASCH, ALWIN. Ueber die chemische Dynamik des Nickelskohlenoxyds. Z. physik. Chem. 40: 1-83 (1902). Bibl. footnotes.

NICKEL CHLORIDES

GUTBIER, A. Nickel und Chlor. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 82-92 (1909).

NICKEL OXIDES

GUTBIER, A. Nickel und Sauerstoff. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 40-55 (1909).

NICKEL SILICATES

LEITMEIER, H. Nickelsilicate. In Doelter, Handb. Mineralchem. 2, pt. 1: 758-773 (1914).

NICKEL STEELS. See STEEL.

NICKEL SULFATES

GUTBIER, A. Nickelsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 64-74 (1909).

NICOTINE

McINDOO, N. E. Effects of nicotine as an insecticide. J. Agr. Res. 7: 89-121 (1916). 25 references.

"Nicotine." Ind.-Cat. S. G. O., 1st ser., 9: 934-935 (1888); 2nd ser., 11: 683-684 (1906).

RASMUSSEN, H. B. [Determination of nicotine in tobacco and tobacco extracts.] Z. anal. Chem. 50: 81-133 (1916).

SCHMIDT, JULIUS. Nicotin. In Abderhalden, Biochem. Handl. 5: 33-34 (1911). 44 footnotes.

See also ALKALOIDS, INSECTICIDES.

NIOBIUM. See COLUMBIUM.

NIRVANINE

"Nirvanine." Ind.-Cat. S. G. O., 2nd ser., 11: 697-698 (1906).

NITON

BRISCOE, H. V. Niton. In Friend, Textbook, 1, pt. 2: 355-360 (1914). Bibl. footnotes.

See also RARE GASES.

NITRATES

BERTRAND, A. Bibliografia de la tecnologia del salitre. 1795-1918. Caliche 1: 18-24 (1919).

GR. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Nitrates. (1913-1919.) London, 1920. 28 p. Bibl., p. 25-28.

JURISCH, KONRAD W. Salpeter und sein Ersatz. Leipzig, Hirzel. 1908. 356 p. Contains bibls.

OSSA, DIAZ. Patentes de invencion referentes a la extraccion del salitre, 1853-1907. Caliche 1: 26-31, 64-69 (1919).

SEMPER, —, and MICHELS, —. La industria del salitre en Chile. Santiago, 1908. 418 p. Bibl., p. 414-418. 105 references.

SINGEWALD, J. T., JR., and MILLER, B. L. The genesis of the Chilean nitrate deposits. Proc. 2nd Pan-Am. Sci. Congr., Washington, D. C., 7: 878-879 (1917). 26 references.

NITRATES: Analysis.

CHAMOT, E. M., and PRATT, D. S. Study of the phenolsulfonic acid method for the determination of nitrates in water. The composition of the reagent and of the reaction product. J. Am. Chem. Soc. 31: 922-928 (1909). 48 references.

DAVIES, CHARLES W. Studies of the phenoldisulfonic acid method for determining nitrates in soils. J. Ind. Eng. Chem. 9: 290-295 (1917). 35 references.

See also NITROGEN: ANALYSIS.

NITRATION

TINGLE, J. B., and BLAMCK, F. C. Studies on nitration. J. Am. Chem. Soc. 30: 1395-1412, 1587-1599 (1908). 150 footnotes.

NITRIC ACID

BLEIER, O., and CHWALA, A. Hochkonzentration der Salpetersäure und Denitrirung. In Bräuer and d'Ans, Fortschritte, 1: 1508-1509 (1922). German patents.

BOYCE, JOHN C. Bibliography of the production of synthetic nitric acid and synthetic ammonia. Met. Chem. Eng. 17: 328-337 (1917). Includes patents.

BRAUN, J. v. Salpetersäure. In Abegg, Handb. anorg. Chem. 3, pt. 3: 155-174 (1907). 116 references.

NITRIC ACID—Cont'd

- COTTRELL, ALLIN. The manufacture of nitric acid and nitrates. London, Gurney, 1923, 454 p. Bibls. on p. 36-37, 204-207, 268, 319-320, 349-358, 393-397; patents listed on p. 208-242 (annotated), 268, 397.
- JURISCH, K. W. Salpetersäure. *In his* Salpeter und sein Ersatz 1908, p. 133-138. Covers 1888-1908.
- MELZER, L., and BRAUER, A. Salpetersäure aus Nitraten. *In* Bräuer and d'Ans, Fortschritte 1: 1455 (1922). German patents.
- OELKER, ADOLF. Verfahren zur Herstellung, Reinigung und Konzentration von Salpetersäure. Z. ges. Schiess- Sprengstw. 9: 317-320, 329-332 (1914). Patents, 1886-1914.
- SCHLENK, W. Salpetersäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 289-321 (1907). References through text.
- SPIEGEL, LEOPOLD. Salpetersäure. *In his* Der Stickstoff, 1903, p. 181-234. Bibl. footnotes.
- WASER, BRUNO. Die Luststickstoffindustrie, mit besonderer Berücksichtigung der Gewinnung von Ammoniak und Salpetersäure. Leipzig, Spamer, 1922, 586 p. Bibl. footnotes. Bibl., p. 551-567.
- WEBB, H. W. Absorption of nitrous gases. New York, Longmans, 1924, 364 p. Bibl. covers 1860-1923.
- WORDEN, E. C. Nitric acid. *In his* Technology of cellulose esters, 1: 665-1006, 10,386 references, including patents.
- See also* ACIDS, ALKALIS AND SALTS; AMMONIA.
- NITRIC ACID: Analytical.**
- SCHLENK, W. Salpetersäure—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 317-321 (1907).
- NITRIC ACID: Toxicology.**
- "Toxicology of nitric acid." Ind.-Cat. S. G. O., 1st ser., 1: 86 (1880); 2nd ser., 1: 115 (1896); 3rd ser., 1: 121-122 (1918).
- NITRIC ANHYDRIDE**
- SCHLENK, W. Stickstoffpentoxyd, Salpetersäureanhydrid, N_2O_5 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 286-289 (1907).
- See also* NITROGEN OXIDES.
- NITRIC OXIDE**
- BRAUN, J. v. Stickoxyd. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 123-131 (1907). 100 references.
- MC EACHRON, KARL B., and GEORGE, R. H. The production of nitric oxides and ozone by high voltage electric discharges. Purdue Univ.,

Eng. Expt. Sta., Bull. No. 9, 1922, 189 p. Bibl., p. 181.

SCHLENK, W. Stickoxyd, NO . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 252-261 (1907).

NITRIFICATION

- ALLEN, E. R., and BONAZZI A. Nitrication. Preliminary observations. Ohio State Agr. Expt. Sta., Tech. Bull. No. 7, 1915. 42 p. 42 references.
- BRIGHAM, REED O. Assimilation of organic nitrogen by *Zea mays* and the influence of *Bacillus subtilis* on such assimilation. Soil Science 3: 155-195 (1917). 60 references.
- BROWN, P. E., and GOWDA, R. N. Effect of certain fertilizers on nitrification. J. Am. Soc. Agron. 16: 145-146 (1924). 24 references.
- CHAMBERS, C. D. The fixation of nitrogen by certain fungi. Plant World 19: 175-194 (1916).
- CHRISTENSEN, H. R. [Fixation of the free atmospheric nitrogen by microorganisms.] Tidsskr. Landbr. Plan-teavl. 16: 303-336 (1909).
- COLEMAN, DAVID A. The influence of sodium nitrate upon nitrogen transformations in soils with special reference to its availability and that of other nitrogenous manures. Soil Science 4: 345-432 (1918). 226 references.
- DORYLAND, C. J. T. Influence of energy material upon the relation of soil microorganisms to soluble plant food. North Dakota Agr. Expt. Sta., Bull. No. 116, 1916, p. 319-401. 70 references.
- FULMER, H. L. Influence of carbonates of magnesium and calcium on bacteria of certain Wisconsin soils. J. Agr. Res. 12: 463-504 (1918). 64 references.
- GAINES, P. L. The significance of nitrification as a factor in soil fertility. Soil Science 3: 414-416 (1917). 32 references.
- GODDARD, H. N. Can fungi living in agricultural soil assimilate free nitrogen. Bot. Gaz. 56: 303-305 (1913). 47 references.
- GREAVES, J. E. Azofication. Soil Science 6: 163-217 (1918). 211 references.
- GREAVES, J. E., CARTER, E. G., and LUND, Y. Influence of salts on azofication in soil. Soil Science 13: 497-499 (1922). 51 references.
- HALL, THOMAS D. Nitrification in some South African soils. Soil Science 12: 301-363 (1921). 49 references.

- HELSELMAN, H. [Studies on nitrification in natural soils and its importance from an ecological point of view.] Meddel. Stat. Skogsförsöksanst., No. 13-14: 297-528 (1916-1917). 87 references.
- HELSELMAN, H. [The effect of regeneration measures on the formation of nitrates in soil and its importance in the regeneration of coniferous forests.] Medel. Stat. Skogsförsöksanst., No. 13-14: 923-1076 (1916-1917). 51 references.
- HILLS, T. L. Influence of nitrates on nitrogen-assimilation bacteria. J. Agr. Res. 12: 185-230 (1918). 49 references.
- HUTCHINSON, H. B., and MILLER, N. H. J. Direct assimilation of inorganic and organic forms of nitrogen by higher plants. Centbl. Bakt., II Abt., 30: 537-547 (1911).
- JACOBITZ, E. Die Assimilation des freien, elementaren Stickstoffs. Zusammenfassende Darstellung nach der umschlägigen Literatur. Centbl. Bakt., II Abt., 7: 783-794, 833-844, 876-890 (1901). 113 references.
- KELLEY, W. P. Nitrification in semi-arid soils. J. Agr. Res. 7: 417-438 (1916). 35 references.
- LAFFAR, FRANZ. [Denitrification. Nitrification.] In his Handb. der technischen Mykologie, 2nd ed., 3: 177, 182.
- LUTZ, L. Les microorganismes fixateurs d'azote. Paris, Lécchevelier, 1904. 187 p. 500 references.
- LYON, T. L., and BIZZELL, J. A. Some relations of certain higher plants to the formation of nitrates in soils. N. Y. Cornell Agr. Sta., Mem. No. 1, 1913. 109 p.
- NEDOKVOCHAYEV, N. [Conditions of accumulation and reduction of nitrates in plants.] Izv. Moscov Selsk. Khoz. Inst. (Ann. Inst. Agron. Moscou) 10: 257-347 (1904). 126 references.
- "Nitrification." Ind.-Cat. S. G. O., 2nd ser., 11: 699-700 (1906).
- PALMANS, L. [Present state of knowledge of micro-organisms which fix free nitrogen.] Ann. Gembloux 18, 289-309 (1908). 60 references.
- ROSSI, GINO DE. Ueber die Mikroorganismen, welche die Wurzelknöllchen der Leguminosen erzeugen. Centbl. Bakt., II Abt., 18: 483-491 (1907).
- VOGEL, J. Die Assimilation des freien, elementaren Stickstoffes durch Mikroorganismen. Centbl. Bakt., II Abt., 15: 33-53, 174-188, 215-227 (1905). 148 references.
- WAKSMAN, SELMAN A. Soil fungi and their activities. Soil Science 2: 148-155 (1916). 125 references.
- WAKSMAN, SELMAN A. Methods for the study of nitrification. Soil Science 15: 258-260 (1923). 51 references.
- NITRIMIC ACID**
- SCHOLL, ROLAND. Zur Kenntniss der Nitrimine und Nitriminsäuren. Ann. 338: 1-15 (1905). 50 footnotes.
- SCHOLL, ROLAND. Konstitution der Nitrimine. Ann. 345: 363-375 (1906). 38 footnotes.
- NITROAMINES**
- BACKER, H. J. Die Nitramine und ihre Isomeren. Sammlung chem. chem.-tech. Vorträge 18: 359-474 (1912). Bibl. footnotes.
- NITROBENZENE**
- BAUM, FRITZ. Nitrobenzol. In Abderhalden, Biochem. Handl. 1: 174-182 (1911). 140 footnotes (includes derivatives).
- MEYER-JACOBSON. Nitroverbindungen. In their Lehrb. org. Chem. 2, pt. 1: 148-161 (1895). Bibl. footnotes.
- "Nitrobenzene." Ind.-Cat. S. G. O., 1st ser., 9: 949-950 (1888); 2nd ser., 11: 700-701 (1906).
- NITROBENZOIC ACIDS**
- MEYER-JACOBSON. Nitrobenzoesäuren. In their Lehrb. org. Chem. 2, pt. 1: 565-568 (1902). Bibl. footnotes.
- NITROCELLULOSE**
- CHRYSTALL, E. R. Nitrocellulose explosives from the standpoint of colloidal chemistry. In First report on colloid chemistry, p. 84 (1917). 19 references.
- HAUSSERMANN, C. Die Nitrocellulosen. Braunschweig, Vieweg, 1914. 34 p. Bibl. footnotes.
- WEBER, H. C. P. On a modified form of stability test for smokeless powder and similar materials. U. S. Bur. Standards, Bull. 9: 128-129 (1912). 22 references.
- WORDEN, E. C. Nitrocellulose. In his Technology of cellulose esters, 1: 1567-2375 (1920). 8359 references, including patents.
- WORDEN, EDWARD C. Nitrocellulose industry. New York, Van Nostrand, 1911. 2 vols. Bibl. footnotes.
- NITRO COMPOUNDS**
- BRAND, KURT. Die elektrochemische Reduction organischer Nitrokörper und verwandter Verbindungen. Sammlung chem. chem.-tech. Vorträge 13: 51-319 (1908). Bibl. footnotes.

NITRO COMPOUNDS—Cont'd

MEISENHEIMER, JAKOB. Reactionen ungesättigter Nitrokörper. *Ann.* 355: 249-311 (1907). 56 footnotes.

MÖLLER, JOH. Die elektrochemische Reduktion der Nitroderivate organischer Verbindungen in experimenteller und theoretischer Beziehung. Halle, Knapp, 1904. 208 footnotes.

SNOWDEN, RALPH C. Electrolytic reduction of nitrobenzene. *J. Phys. Chem.* 15: 797-844 (1911). 125 footnotes.

STEINKOPF, WILHELM. Beiträge zur Kenntniss des Einflusses negativer Atome und Atomgruppen bei Derivaten des Acetonitrils und Acetamids. *J. prakt. Chem.* 189: 97-148 (1910). *Bibl.* footnotes.

STEINKOPF, WILHELM, and JÜRGENS, B. Ueber die Konstitution der *aci*-Nitrokörper. *J. prakt. Chem.* 192: 686-713 (1911). *Bibl.* footnotes.

NITROGEN

BRAUN, J. v. Stickstoff. In *Abegg, Handb. anorg. Chem.* 3, pt. 3, 219-239 (1907). 1126 references. Includes ammonia, nitrogen oxides, nitric acid, nitrous acid, hydroxylamine, etc.

FISCHER, HERMAN E. The nitrogen industry. *J. Franklin Inst.* 190: 187-209 (1920).

GILBERT, CHESTER G. Political and commercial control of the nitrogen resources of the world. *Chem. Met. Eng.* 22: 558-559 (1920); selected *bibl.* of 80 references.

GT. BRIT. Ministry of munitions. Nitrogen products committee. Final report. London, 1919. 357 p. "Classified list of references to official reports and technical publications," p. 325-326. About 100 references.

HÉBERT, ALEXANDER. Azote. In *Moissan, Chim. min.* 1: 555-661 (1904). 1185 footnotes.

MOLDENHAUER, WILHELM. Die Reaktionen des freien Stickstoffs. Berlin, Bornträger, 1920. 178 p.

"Nitrogen." *Ind.-Cat. S. G. O.*, 1st ser., 9: 950 (1888); 2nd ser., 11: 702-703 (1906).

POLLITZER, F. Stickstoff. In *Brauer and d'Ans, Fortschritte*, 1: 1195-1197 (1922). 97 German patents.

SCHLENK, W. Stickstoff. In *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 168-331 (1907). References through text.

SPIEGEL, L. Der Stickstoff und seine wichtigsten Verbindungen. Braunschweig, Vieweg, 1903. Numerous *bibl.* footnotes.

WAESER, BRUNO. Fortschritte der anorganischen Grossindustrie. 1921-1923. Stickstoff und seine Verbindungen. *Chem.-Ztg.* 48: 821, 825, 841, 846, 861, 866, 883, 890, 905, 913, 934, 954 (1924). 692 footnotes.

NITROGEN: Analytical.

GREAVES, J. E., and HIRST, C. T. Some factors influencing the quantitative determination of nitric nitrogen in the soil. *Soil Science* 4: 200-203 (1917). 58 references.

HEPBURN, JOSEPH S. Modifications of the Kjeldahl method for the quantitative determination of nitrogen. *J. Franklin Inst.* 166: 82-99 (1908). 39 references.

HURUN, FREDERIK, and FAY, HENRY. The determination of nitrogen in steel. *Chem. Met. Eng.* 26: 218-222 (1922).

KEBLER, L. F. Index to the literature on the estimation of nitrogen by Kjeldahl's method and its modifications. *J. Anal. Appl. Chem.* 5: 260-278 (1891). 59 references on Kjeldahl method, 208 references on other methods.

MESTREZAT, W., and JANET, N. P. [Nitrogen titratable by the Kjeldahl method.] *Bull. soc. chim. biol.* 3: 105-130 (1921).

WALLER, E., and BOWEN, H. C. The Kjeldahl process for the determination of nitrogen. *J. Anal. Appl. Chem.* 2: 292-300 (1888). 45 references.

NITROGEN: Fixation.

ASKENASY, PAUL, and GRUDE, F. Ueber die Einwirkung von Stickstoff auf Gemenge von Bariumoxyd und Kohle bei hoher Temperatur. *Z. Elektrochem.* 28: 150-151 (1922). 56 references.

BENETSCH, A. Die volkswirtschaftliche Bedeutung der Torfmoore und Wasserkräfte unter besonderer Berücksichtigung der Luftstickstofffrage. Berlin, Siemenroth, 1914. 229 p. 212 references and list of patents on nitrogen fixation.

BERTRAND, ALEJANDRO. [The Haber process for the industrial synthesis of ammonia.] *Bol. soc. nac. mineria* 29: 343-387; 30: 441-471 (1917). The second part is a complete *bibl.* of the subject.

BRION, G. Luftsalpeter. Berlin, 1912. 154 p. 87 references on electrical methods.

CREIGHTON, HENRY J. M. Bibliography of literature on and relating to nitrogen fixation and the oxidation of ammonia. *J. Franklin Inst.* 187: 716-735 (1919). About 400 ref-

- erences. Classified as follows: General; direct oxidation; direct combination with hydrogen; cyanamide; nitrides; cyanides.
- DONATH, —, and FRENZEL, —. Die technische Ausnutzung des Atmosphärischen Stickstoff. Leipzig, 1907.
- HOSMER, HELEN R. Literature of the nitrogen industries, 1912-1916. *J. Ind. Eng. Chem.* 9: 424-438 (1917); *Gen. Elec. Rev.* 20: 76-85, 156-164, 252-259 (1917). 152 references, classified by processes, uses, costs and recovery.
- JURISCH, K. W. [Nitric acid from air.] *In his* Salpeter und sein Ersatz, 1908, p. 339-356. Covers 1781-1908.
- JURISCH, K. W. Ueber Luftsalpeter. Leipzig, Degener, 1914. 20 p.
- KNOX, J. The fixation of atmospheric nitrogen. New York, Van Nostrand, 1914. 132 p. 153 references on p. 115-121.
- MARSHALL, F. Ueber die Ausnutzung des atmosphärischen Stickstoffs auf natürlichem und künstlichem Wege. *Naturwissenschaften* 1: 791-795, 805-809 (1913). Bibl. footnotes.
- MAXTED, E. B. Ammonia and the nitrides. London, Churchill, 1921. 124 p.
- MAXTED, E. B. The nitrogen industry in 1922. *Chem. Age* (London) 7: 917-922 (1923). References through text.
- NORTON, THOMAS H. Utilization of atmospheric nitrogen. U. S. Dept. Commerce, Special Agent Series No. 52, 1912. 178 p. Bibl., p. 177-178. About 50 references.
- SCHUCHART, G. Die technische Gewinnung von Stickstoff, Ammoniak und schwefelsaurem Ammonium. *Sammlung chem. chem.-tech. Vorträge* 25: 240-260 (1919). Patents.
- STUNTZ, STEPHEN C. Reference list on the electric fixation of atmospheric nitrogen and the use of calcium cyanamid and calcium nitrate on soils. U. S. Dept. Agr., Bur. Soils, Bull. No. 63, 1910. 89 p.
- U. S. Ordnance Dept. Nitrate Division. Report on the fixation and utilization of nitrogen. Washington, 1922. 353 p. Bibl., p. 343-353. 125 references.
- WAESER, BRUNO. Die Luftstickstoffindustrie. Mit besonderer Berücksichtigung der Gewinnung von Ammoniak und Salpetersäure. Leipzig, Spamer, 1922. 586 p. Bibl., p. 551-567.
- WARE, EZRA J. An index of researches upon the production of ammonia from atmospheric nitrogen. *Proc. Mich. State Pharm. Assoc.*, 1888, 124-134.
- See also* AMMONIA, FERTILIZERS: NITROGEN COMPOUNDS (Stuntz); NITRIC ACID, NITRIFICATION, NITROGEN.
- NITROGEN: Stereochemistry.**
- WEDEKIND, E. Die Entwicklung der Stereochemie des fünfwertigen Stickstoffs im letzten Jahrzehnt. *Sammlung chem. chem.-tech. Vorträge* 14: 173-212 (1909). Bibl. footnotes.
- NITROGEN IODIDE**
- CHATTAWAY, F. D., and ORTON, K. J. P. Formation and constitution of nitrogen iodide. *Am. Chem. J.* 24: 355 (1900). 33 references.
- DITZ, HUGO. Jodstickstoffe. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 373-379 (1909).
- NITROGEN OXIDES**
- PAULING, H. Stickoxyde. *In* Bräuer and d'Ans, *Fortschritte* 1: 1258-1262 (1922). German patents.
- SPIEGEL, LEOPOLD. [Nitrogen oxides.] *In his* Der Stickstoff, 1903.
- See also* names of the various oxides.
- NITROGEN PEROXIDE**
- BRAUN, J. v. Untersalpetersäure. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 3: 131-139 (1907). 75 references.
- SCHLENK, W. Stickstofftetroxyd. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 1: 276-286 (1907). References through text.
- NITROGEN SULFIDE**
- LINNE, BR. Schwefelstickstoff, N₂S₄. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 1: 614-620 (1907).
- NITROGEN TRICHLORIDE**
- DITZ, HUGO. Chlorstickstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 2: 161-164 (1909).
- NITROGLYCEROL**
- "Nitroglycerol." *Ind.-Cat. S. G. O.*, 1st ser., 9: 951 (1888); 2nd ser., 11: 703-704 (1906).
- See also* EXPLOSIVES.
- NITRON**
- COPE, W. C., and BARAB, J. Bibliography of literature on nitron. *J. Am. Chem. Soc.* 39: 513-514 (1917); *Chem. Eng.* 25: 94-95 (1917). 30 references.
- NITROPARAFFINS**
- MEYER-JACOBSON. Alkylnitroverbindungen (Nitroparaffin). *In their* *Lehrb. org. Chem.* 1, pt. 1: 400-419 (1907). Bibl. footnotes.
- See also* NITRO COMPOUNDS.
- NITROPHENOLS**
- MEYER-JACOBSON. Nitrophenole. *In their* *Lehrb. org. Chem.* 2, pt. 1: 382- (1902).

NITROPROTEINS

- JOHNSTON, TREAT B., and KOHMANN, E. F. Nitrated proteins. *J. Am. Chem. Soc.* 37: 1863-1884 (1915). 50 references.

NITROSO COMPOUNDS

- SCHMIDT, JULIUS. Die Nitrosoverbindungen. Sammlung chem. chem.-tech. Vorträge 8: 409-448 (1903). Bibl. footnotes.

NITROSYLSULFURIC ACID

- EPHRAIM, F. Nitrosylschwefelsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 265-276 (1907). References through text.

NITROUS ACID

- BRAUN, J. v. Salpetrige Säure. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 142-153 (1907). 75 references.

- SCHLENK, W. Salpetrige Säure, HNO_2 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 265-276 (1907).

NITROUS ACID: Analytical.

- FISCHER, FERD. Bestimmung der salpetrigen Säure im Trinkwasser. *Ding. Poly. J.* 212: 404-409. Chronological.

- SCHLENK, W. Salpetrige Säure—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 272-274 (1907).

NITROUS ANHYDRIDE

- BRAUN, J. v. Stickstofftrioxyd. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 139-142 (1907). 16 references.

- SCHLENK, W. Stickstofftrioxyd, Salpetrigsäureanhydrid, N_2O_5 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 261-264 (1907).

- TRAUTZ, M. [Existence of N_2O_5] *Z. physik. Chem.* 47: 519-520 (1904). 40 references.

NITROUS OXIDE

- BASKERVILLE, CHARLES, and STEVENSON, RESTON. Contributions to the chemistry of anesthetics. III. Nitrous oxide. *J. Ind. Eng. Chem.* 3: 579-582 (1911). Bibl. footnotes.

- BRAUN, J. v. Stickoxydul. *In* Abegg, Handb. anorg. Chem. 3, pt. 3: 201-207 (1907). 70 references.

- "Nitrous oxide." *Ind.-Cat. S. G. O.*, 1st ser., 9: 951-954 (1888); 2nd ser., 11: 704-707 (1906).

- SCHLENK, W. Stickoxydul, N_2O . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 240-248 (1907).

- WIELAND, HEINRICH. Ueber Addition-reactionen mit nitrosen Gasen. *Ann.* 328: 154-255 (1903). 97 footnotes.

NOVOCAIN

- "Klinische Berichte und wissenschaftliche Abhandlungen ueber Novo-

cain." Hoechst a. M., Farbwerke vorm Meister Lucius und Bruning, 1915[?]. 360 p. Bibl., p. 329-360.

NUCLEASES. See ENZYMES.**NUCLEIC ACIDS**

- BRAHM, CARL. Nukleinsäuren und Spaltprodukte. *In* Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, 80-104. 64 footnotes. 2nd ed., 1: 324-350 (1924). 90 footnotes.

- FEULGEN, R. Chemie und Physiologie der Nukleinstoffe nebst Einführung in die Chemie der Purinkörper. Berlin, Borntraeger, 1923. 432 p. 928 footnotes.

- JONES, WALTER. Nucleic acids. *In* Barker, Endocrinology and metabolism, 3: 135-160; references, 5: 345-509 (1922).

- JONES, WALTER. Nucleic acids, their chemical properties and physiological conduct. 2nd ed. New York, Longmans, 1920. 150 p. Bibl., p. 129-148.

- "Nucleic acid." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 134-135 (1918).

- "Nuclein." *Ind.-Cat. S. G. O.*, 2nd ser., 11: 822-823 (1906).

- "Nucleoproteids." *Ind.-Cat. S. G. O.*, 2nd ser., 11: 824 (1906).

- "Nuklein und Nukleinsäure." *In* Merck's annual report, 27: 1-43 (1914). Footnotes. Bibl., p. 32-42.

- ROLLETT, ADOLF. Nucleoproteide und Nukleinsäuren. *In* Abderhalden, Biochem. Handl. 4: 986-1013 (1911); 9: 237-254 (1915). Bibl. footnotes.

- SCHITTENHELM, ALFRED, and BRAHM, KARL. Nucleoproteide und ihre Spaltprodukte. *In* Oppenheimer, Handb. Biochem. 1: 599-653 (1909). 220 footnotes.

- TANNHAUSER, S. J. Nucleoproteide und Nucleinsäuren. *In* Abderhalden, Biochem. Handl. 10: 96-112 (1923). Bibl. footnotes.

NUTRITION

- AMERICAN RED CROSS. Nutrition bibliography. New York, Am. Red Cross Health Service, 1921. 30 p. Contains a list of bibls.

- AMERICAN RESEARCH INSTITUTE. Medical Dept. Bibliography of titles on nutrition contained in the supplementary card catalogue of the Library of the Surgeon General's Office, 1906-1917. Washington, 1917. 16 p. Mimeographed.

- ARON, HANS. [The important results of researches in nutrition, metabolism and growth in 1914-1918.] *Monatsschr. Kinderheilk* 17: 257-290 (1921).

- BENEDICT, FRANCIS G., and RITZMAN, ERNEST G. Undernutrition in steers. Its relation to metabolism, digestion and subsequent realimentation. Washington, Carnegie Inst., Pub. No. 324, 1923. 333 p. Bibl. footnotes.
- CRUMBINE, S. J. Report of committee to assemble current literature on subject of nutritional disorders. The results of so-called devitalized foods. Proc. Assoc. Am. Dairy Food and Drug Officials, 1916, p. 81-86.
- FOLENA, UMBERTO. Esperienze sul minimo di azoto nella razione alimentare normale in regime di riposo e di lavoro. Ann. Ig. Sper., n. s. 22: 393-396 (1912).
- HOFMEISTER, FRANZ. Ueber qualitativ unzureichende Ernährung. Ergeb. Physiol. 16: 1-6, 510-520 (1918).
- LEGRENDRE, R. Problèmes scientifiques d'alimentation en France pendant la guerre. Paris, Masson, 1919. 169 p. Annotated bibl. of French publications on nutrition during 1914-1918.
- LUSK, GRAHAM. Physiological effects of undernutrition. Physiol. Rev. 1: 550-552 (1921). 58 references.
- MCCOLLUM, ELMER V. The newer knowledge of nutrition; the use of food for the preservation of vitality and health. New York, Macmillan, 1918. 199 p. Bibl., p. 191-195.
- MORGULIS, SERGIUS. Fasting and undernutrition; a biological and sociological study of inanition. New York, Dutton, 1923. 407 p. Bibl., p. 311-396.
- MOULTON, CHARLES R. The use of meat; digests of scientific literature and original articles on the nutritive value of meat and its place in the diet. Chicago, Bureau of Nutrition, Inst. Am. meat packers, 1924. 15 p. (Bull. No. 2.)
- NEUMANN, R. O. Experimentelle Beiträge zur Lehre von dem täglichen Nahrungsbedarf des Menschen unter besonderer Berücksichtigung der notwendigen Eiweissmenge. Arch. Hyg. 45: 82-87 (1902). 136 references.
- "Nutrition." Ind.-Cat. S. G. O., 1st ser., 9: 1043-1048 (1888); 2nd ser., 11: 845-858 (1906).
- ROTHSCHILD, HENDRI DE. L'allaitement mixte et l'allaitement artificiel. Paris, Masson, 1898. 659 p. Bibl., p. 355-651.
- SHERMAN, H. C. Chemistry of food and nutrition. 2nd ed. New York, 1918. Bibl. at end of chapters.
- SJÖLEMA, B. Ergebnisse und Probleme der modernen Ernährungslehre. Ergeb. Physiol. 20: 207-406 (1921). Bibl. footnotes.
- VANDEVELDE, A. J. J., and VAN BERE-STEYN, H. W. J. [Bibliography of Belgian publications on nutrition and hygiene.] Verslag en Meded. K. Vlaam. Acad. Taal en Letterk., 1913: 697-756.
- WOLL, R. W. On the relation of food to the production of milk and butter fat by dairy cows. Wisconsin Agr. Expt. Sta., Bull. No. 116, 1904. 85 p. Bibl., p. 80-84. 151 references. See also CORN, FOODS, METABOLISM, VITAMINS.
- NUX VOMICA**
"Nux vomica." Ind.-Cat. S. G. O., 1st ser., 9: 1048-1049 (1888); 2nd ser., 11: 855 (1906).
See also ALKALOIDS; STRYCHNINE.
- OATS**
EBERT, W. [Composition of oats as affected by fertilization, hilling and rate of seeding.] Mitt. Landw. Inst. Leipzig, 1911, No. 10: 3-88. 123 references.
- OCTANES**
BAUM, FRITZ. Octane. In Abderhalden, Biochem. Handl. 1: 104-107 (1911). 40 references (includes derivatives).
See also HYDROCARBONS.
- OCTOIC ACID**
SCHMIDT, E. Octansäure. In Abderhalden, Biochem. Handl. 1: 991-993 (1911). 40 footnotes (includes derivatives).
See also ACIDS, ORGANIC.
- OIL: Fuel.** See FUEL OIL.
- OIL SHALE**
ALDERSON, VICTOR C. The oil shale industry. New York, Stokes, 1920. 175 p. Bibl., p. 163-170. 125 references.
- ALDERSON, VICTOR C. Directory of oil shale retorts with bibliography. Colorado School of Mines Quarterly 15: suppl. for Oct., 1920. 21 p. Bibl., p. 18-21.
- ALDERSON, VICTOR C. The oil shale industry—a selected bibliography. Colorado School of Mines Quarterly 16: 27-38 (1921).
- ALDERSON, VICTOR C. Oil shale—bibliography of recent articles. Colorado School of Mines Quarterly 16: 74-76 (Oct., 1921).
- ALDERSON, VICTOR C. Oil shale—a resume for 1921-1923. Railroad Red Book 39: 7-14 (1922); 40: 23-32 (1923); 41: 11-16 (1924). Colorado School of Mines, Circ. of Information, 1922. 8 p. Colorado School of Mines Quarterly 18: No. 1. Suppl. B, 1923. 28 p. 19: No. 1 (1924).

OIL SHALE—Cont'd

- BURROUGHS, E. H., and GAVIN, M. J. Oil shale. Bur. of Mines, Repts. of Investigations, No. 2277. 295 references, covering period 1915-1920. A selected bibl. is also given in Bull. No. 210, 1922, p. 185-194. 74 references.
- CRONSHAW, HARRY B. Oil shales. London, Murray, 1921. 80 p. Bibl., p. 75-80.
- DALTON, W. H. Bibliography of British oil shale (including torbanite). J. Inst. Petroleum Tech. 2: 178-182 (1916).
- ELLS, S. C. Notes on the economic aspects of a Canadian oil shale industry. Can. Chem. J. 9: 185-186 (1920). 100 references.
- GAVIN, M. J., HILL, H. H., and PERDEV, W. E. Notes on the oil shale industry with particular reference to the Rocky Mountain district. U. S. Bur. Mines, Rept. of Investigations, No. 2256, 1921. 258 references.
- HINDS, NORMAN E. A. The oil shales of northwestern Colorado. Colorado Bur. Mines, Bull. No. 8, 1919. Bibl., p. 47-51. 50 references.
- McKEE, RALPH H., and LYDER, E. E. The thermal decomposition of shales. J. Ind. Eng. Chem. 13: 617-618 (1921). 28 references.
- McKEE, R. H., and GOODWIN, R. T. Chemical examination of the organic matter in oil shales. Colorado School Mines Quarterly 18: No. 1, suppl. A: 40-41 (1923). 61 references.
- MUHLEN, LEO v. Die Ölschiefer des europäischen Russlands. Leipzig, Teubner, 1921. 31 p. Bibl., p. 30-31.
- "Oil shale bibliography, 1919-1920." Railroad Red Book, 37: 33-36 (1920); 38: 30-37 (1921). 1924. *Ibid.* 42, no. 1: 12-15, 272 (1925).
- WINCHESTER, D. E. Oil shale in northwestern Colorado and adjacent areas. U. S. Geol. Sur., Bull. No. 641, 1916. Bibl., p. 139-198. 126 references. Annotated.
- WINCHESTER, DEAN E. Oil shale of the Rocky Mountain region. U. S. Geol. Sur., Bull. No. 729, 1923. 204 p. Bibl., p. 143-202. Complete up to Mar. 1, 1922.
- OILS.** *See* FATS, OILS AND WAXES; PETROLEUM; names of individual oils.
- OILS: Drying.**
- MEYERHEIM, G. Die gehärteten Oele. Fortschritte Chem. 8: 293-307 (1913). References through text.
- See also* LINSEED OIL, ETC.

OILS: Emulsification.

- HERSCHEL, WINSLOW H. Resistance of an oil to emulsification. U. S. Bur. Standards, Tech. Paper No. 86, 1917. 37 p. 40 footnotes.

See also EMULSIONS.

OILS: Textile.

- ERBAN, FRANZ. Die Anwendung von Fettstoffen und daraus hergestellter Produkten in der Textil-Industrie. Halle, Knapp, 1911. 364 p. Bibl., p. 311-342.

OLEIC ACID

- FAHRION, W. Zur Geschichte der Oelsäure. Chem. Umschau 23: 2-8 (1916). 40 footnotes.
- MEYER-JACOBSON. Oelsäure. *In their* Lehrb. org. Chem. 1, pt. 1: 972-977, 992 (1907). Bibl. footnotes.
- SCHMIDT, ERNST. Ölsäure. *In* Abderhalden, Biochem. Handl. 1: 1037-1041 (1911). 80 footnotes.

OLEOMARGARINE. *See* MARGARINE; DAIRY PRODUCTS.**OLEORESINS**

- DUMEZ, ANDREW G. A century of the U. S. Pharmacopoeia, 1820-1920. I. The gellenical oleoresins. Trans. Wis. Acad. Sci. 19: 1135-1194 (1919). Bull. Univ. Wisconsin, No. 980. 288 p. Annotated with subject index. Includes aspidum, capsicum, cubeb, ginger, lupulin, parsley, pepper, etc.

OLIGOCLASE

- DOELTER, C. Oligoklas. *In his* Handb. Mineralchem. 2, pt. 3: 219-236 (1921). Bibl. footnotes.

OLIVE OIL

- "Olive oil." Ind.-Cat. S. G. O., 1st ser., 10: 129 (1889); 2nd ser., 12: 148 (1907).

See also FATS, OILS AND WAXES.

OPAL

- LEITMEIER, H. Opal ($\text{SiO}_2 \cdot x\text{H}_2\text{O}$). *In* Doelter, Handb. Mineralchem. 2, pt. 1: 240-265 (1914). Bibl. footnotes.

See also PRECIOUS STONES, SILICA.

OPIANIC ACID

- DOHRN, M., and THIELE, A. Opiansäure. *In* Abderhalden, Biochem. Handl. 1: 1323-1325 (1911). Bibl. footnotes.

- MEYER-JACOBSON. Opiansäure. *In their* Lehrb. org. Chem. 2, pt. 1: 717 (1902).

OPIUM

- KAPPELMEIER, PAUL. Die Konstitutionserforschung der wichtigsten Opiumalkaloide. Sammlung chem. chem.-tech. Vorträge 18: 225-358 (1912). Bibl. footnotes.

KLEE, WALTER. Ueber die Alkaloide von *Papaver orientale*. Arch. Pharm. 252: 211-273 (1914). Bibl. footnotes.

"Opium." Ind.-Cat. S. G. O., 1st ser., 10: 157-169 (1889); 2nd ser., 12: 184-190 (1907).

ZWALUWENBERG, ABR. VAN. Bibliography of the opium assay and dictionary of its methods. Proc. Mich. State Pharm. Assoc. 5: 140-157 (1887).

See also ALKALOIDS, MORPHINE.

OPTICAL ACTIVITY

ADRIANI, J. H. Erstarrungs- und Umwandlungsercheinungen optischer Antipoden. Z. physik. Chem. 33: 453-476 (1900). Bibl. footnotes.

CHENEVEAU, C. Les propriétés optiques des solutions. Paris, Gauthier, 1913. 240 p. Bibl., p. 225-236. See also Ann. chim. phys. 12: 143-228, 289-393 (1908).

GROSSMANN, H., and WRESCHNER, MARIE. Die anomale Rotationsdispersion. Sammlung chem. chem.-tech. Vorträge 26: 259-314 (1922). Bibl. footnotes.

JAEGER, F. M. [The rotatory power of chemical compounds in relation to their molecular configuration and the theory of asymmetric atoms.] Bull. soc. chim. 33: 853-889 (1923). Bibl. footnotes.

LANDOLT-BÖRNSTEIN. Spezifische Drehung aktiver organischer Substanzen. In their Tabellen, 4th ed., 1912, p. 1052-1059; 5th ed., 1923, p. 999-1007. Bibl. through text.

RAKUZIN, M. A. [Collection of data on the optical activity of albumins, enzymes, toxins and sera.] J. Russ. Phys. Chem. Soc. 48: 1251-1294 (1916).

RUPE, H. Ueber den Einfluss der Kohlenstoffdoppelbindung auf das Drehungsvermögen optisch aktiver Substanzen. Ann. 327: 157-186 (1903). 80 footnotes.

RUPE, HANS. Einige Untersuchungen ueber den Einfluss der Constitution auf das Drehungsvermögen optisch aktiver Substanzen. Ann. 369: 311-369 (1909). 63 footnotes.

RUPE, H. Influence of certain groups on rotatory power. Trans. Faraday Soc. 10: 46-59 (1914). Bibl. footnotes.

SCHOLTZ, M. Die optisch-aktiven Verbindungen des Schwefels, Selen, Zinns, Siliziums und Stickstoffs. Sammlung chem. chem.-tech. Vorträge 11: 442-480 (1907). Bibl. footnotes.

TABLE ANNUELLES. Pouvoir rotatoire. 1: 189-217 (1910); 2: 329-338 (1911); 3: 239-257 (1912); 4: 624-626 (1913-1916). References to all quantitative work from 1910-1916, incl.

TSCHUGAEFF, LEO. Anomalous rotatory dispersion. Trans. Faraday Soc. 10: 70-79 (1914). Bibl. footnotes.

OPTOCHIN. See QUININE (Laqueur).

ORCINOL

EINBECK, H. Orcin. In Abderhalden, Biochem. Handl. 1: 639-644 (1911). 80 footnotes.

MEYER-JACOBSON, Orcin. In their Lehrb. org. Chem. 2, pt. 1: 418 (1896).

ORES

EMMONS, W. H. Enrichment of ore deposits. U. S. Geol. Sur., Bull. No. 625, 1917. 503 p. Bibl., p. 20-33. Bibl. footnotes.

ORGANIC CHEMISTRY

ACKERMANN, F. Organische Arbeitsmethoden. Fortschritte Chem. 1: 179-184 (1909); 2: 243-254 (1910). References through text.

BAUM, ERICH. Die organische Elementarsynthese in der Technik. Naturwissenschaften 8: 577-581, 596-600, 616-622 (1920). Bibl. footnotes.

BENARY, E. Organische Chemie. Fortschritte Chem. 5: 131-154 (1912); 7: 31-38, 63-70 (1913); 8: 277-292 (1913); 10: 225-242 (1914-1915); 14: 25-42 (1918-1919). References through text.

BLUMBERG, B. Organische Arbeitsmethoden. Fortschritte Chem. 4: 177-194 (1911). References through text.

CHEMICAL SOCIETY. Organic chemistry. In Annual reports on the progress of chemistry, 1+ . 1904 to date. Bibl. footnotes. In vols. 1-8 there are two main divisions: aliphatic and aromatic and other cyclic compounds. In vols. 9 to date there are three such divisions: aliphatic, homocyclic and heterocyclic compounds.

COHN, LASSAR. Arbeitsmethoden für organisch-chemische Laboratorien. 5th ed. Leipzig, Voss, 1923. 2 vols. Bibl. footnotes.

CONNERADE, E. Deux années de progrès en chimie organique. Bull. soc. chim. Belg. 23: 13-66, 148-170, 226-252 (1909). 179 footnotes.

GÖSSLING, W. Die Industrie organischen Präparate. Z. angew. Chem. 22: 961-967 (1909); 75 footnotes. 23: 869-878 (1910); 98 footnotes.

ORGANIC CHEMISTRY—*Cont'd*

GÖSSLING, W. Fortschritte der organischen Chemie im Jahre 1909. *Z. angew. Chem.* 23: 1855, 1879, 1925 (1910). 235 footnotes.

HOLLEMAN, A. F. Some factors influencing substitution in the benzene ring. *Chem. Rev.* 1: 229-230 (1924). 51 references.

HOLLINS, CECIL. The synthesis of nitrogen ring compounds. London, Benn, 1924. Author and patents index.

HOUBEN, J. Die Methoden der organischen Chemie. Leipzig, Thieme, 1922. 3 vols. Bibl. footnotes.

GROSSMANN, H. Organische Arbeitsmethoden. Fortschritte Chem. 6: 33-43 (1912-1913). References through text.

LIEBERMANN, H. Organische Experimentalchemie. Fortschritte Chem. 1: 107-118, 185-192, 269-275, 301-306 (1909); 2: 123-137 (1910); 3: 85-103 (1910-1911); 4: 23-33 (1911). References through text.

LOWY, ALEXANDER, and HARROW, BENJAMIN. An introduction to organic chemistry. New York, Wiley, 1924. 389 p. Bibl., p. 365-375.

MEYER, HANS. Analyse und Konstitutionsermittlung organischer Verbindungen. Berlin, Springer, 1922. 1191 p. Bibl. footnotes.

MEYER, VICTOR, and JACOBSON, PAUL. Lehrbuch der organischen Chemie. Berlin, Veit, 1902-1924. 2 vols. in 6 parts. Bibl. footnotes.

MOHR, E. Fortschritte der organischen Chemie. Chem.-Ztg. 36: 269-270, 274-276, 286-288 (1912); 37: 549-550, 562-564, 590-591 (1913); 38: 493-494, 527-529, 570-572, 602-603 (1914); 40: 557-559, 579-581, 607-608, 618-620, 646-648 (1916). Bibl. footnotes.

MÜLLER, W. Organische Arbeitsmethoden. Fortschritte Chem. 8: 27-42 (1913); 10: 33-40 (1914-1915).

POPE, F. G. Modern research in organic chemistry. New York, Van Nostrand, 1913. 324 p. Bibl. at end of chapters.

PRAGER, BERNHARD, and JACOBSON, PAUL. Beilstein's Handbuch der organischen Chemie. Berlin, Springer, 1918-?. 4th ed. is to be issued in about 15 vols., of which 6 have appeared (1924).

SCHMIDT, JULIUS. Ueber den Einfluss der Kernsubstitution auf die Reaktionsfähigkeit aromatischer Verbindungen. Sammlung chem. chem.-tech. Vorträge 7: 283-376 (1902). Bibl. footnotes.

STELZNER, ROBERT. Literatur-Register der organischen Chemie, geordnet nach M. M. Richters Formelsystem. Berlin, Springer, 1913-1923. 4 vols. This gives a complete survey of the literature of organic chemistry between 1910 and 1917. It thus supplements Beilstein.

WEDEKIND, E. Fortschritte der organischen Chemie. *Z. angew. Chem.* 18: 721-726, 769-775, 803-813 (1905); 291 footnotes. 19: 1247-1261, 1293-1302 (1906); 313 footnotes. 20: 1089-1098, 1177-1184, 1229-1233 (1907); 316 footnotes. 21: 1442-1453, 1491-1501 (1908); 286 footnotes. 22: 1297-1309, 1349-1360, 1406-1410 (1909); 327 footnotes.

WERNER, A. Die neueren Forschungen auf organischem Gebiete. *Chem. Z.* 1: 214-217, 242-246, 275-278, 470-473, 501-503 (1902). 150 footnotes.

WERNER, A. Die theoretischen Bestrebungen auf organische Gebiete. *Chem. Z.* 1: 1-5, 25-28 (1901). 120 footnotes.

WERNER, A., and PFEIFFER, P. Organische Chemie. *Chem. Z.* 3: 585, 607, 629, 653, 677, 705, 729 (1904). 158 footnotes.

WINTHER, ADOLF. Zusammenstellung der Patente auf dem Gebiete der organischen Chemie, 1877-1905. Giessen, Töpelmann, 1908. 3 vols. 4000 p. Principally German patents.

Serial

Jahrbuch der organischen Chemie. (Edited by G. Minunni). 1893-1895. Classified by groups of chemical compounds.

Jahrbuch der organischen Chemie. (Edited by J. Schmidt.) 1908-1913, 1923. The volumes covering 1914-1922 have not appeared. The material is classified in the usual manner.

See also numerous headings through this work dealing with special aspects of organic chemistry.

ORNITHINE

WINTERSTEIN, E., and TRIER, G. Ornithin. In *Abderhalden, Handb. Biochem.* 4: 633-637 (1911); 9: 126 (1915). 35 footnotes.

See also AMINO ACIDS.

ORTHOCHLORITE

DOELTER, C. Orthochlorit. In *his Handb. Mineralchem.* 2, pt. 2: 637-668 (1917). Bibl. footnotes.

See also SILICATES.

ORTHOCLASE. See FELDSPAR, POTASSIUM ALUMINIUM SILICATE.

ORTHOFORM

"Orthoform." Ind.-Cat. S. G. O., 2nd ser., 12: 227 (1907).

ORTHOPHOSPHORIC ACID

GUTBIER, A. Orthophosphorsäure. In *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 129-173 (1911).

See also PHOSPHORIC ACID.

OSMIUM

FRIEND, J. N. Osmium. In *his Text-book*, 9, pt. 1: 208-234 (1920). Bibl. footnotes.

PÉCHARD, —. Osmium. In *Moissan, Chim. min.* 5: 667-689 (1906). 147 footnotes.

See also PLATINUM (Howe), RARE EARTHS.

OSMOTIC PRESSURE

BARTELL, F. E. Membrane potentials and their relation to anomalous osmose. In *Colloid symposium monograph*, Univ. Wisconsin, 1923, p. 120-135. 30 footnotes.

BOTTAZZI, FIL. Osmotischer Druck und elektrische Leitfähigkeit der Flüssigkeiten der einzelligen pflanzlichen und tierischen Organismen. *Ergeb. Physiol.* 7: 162-171 (1908). 233 references.

CARPENTER, DWIGHT C. The anomalous osmose of solutions of electrolytes with colloidal membranes. Thesis, Univ. Michigan, 1921. 56 p. Bibl. footnotes.

FINDLAY, ALEX. Osmotic pressure. 2nd ed. New York, Longmans, 1919. 116 p. Bibl., p. 107-111. 177 references.

HOBER, RUDOLF. Der osmotische Druck und die Theorie der Lösungen. Der osmotische Druck in den Organismen. In *his Physikalische Chemie der Zelle*, 4th ed., 1914, p. 1-84. Bibl. footnotes.

LANDOLT-BÖRNSTEIN. Osmotischen Druck. In *their Tabellen*, 5th ed., 1923, p. 1423.

"Osmosis." Ind.-Cat. S. G. O., 1st ser., 10: 221 (1889); 2nd ser., 12: 239-241 (1907).

OSTWALD PROCESS. See NITROGEN FIXATION.**OVALBUMIN**

SAMUELY, FRANZ. Ovalbumin. In *Abderhalden, Biochem. Handl.* 1: 66-78 (1910); 9: 16-17 (1915). 140 footnotes.

OVERVOLTAGE

BENNETT, C. W., and THOMPSON, J. G. Overvoltage. *Trans. Am. Electrochem. Soc.* 29: 269-300 (1916). 54 references.

OXALIC ACID

GUTBIER, A. Oxalate. In *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 702-707 (1911).

MEYER-JACOBSON. Oxalsäure. In *their Lehrb. org. Chem.* 1, pt. 2: 305-326 (1913). Bibl. footnotes.

SCHRÖDER, K. Studien ueber die Mitwirkung des Luftsauerstoffs bei der Oxydation der Oxalsäure durch höhere Manganoxyside. *Z. oeffentl. Chem.* 16: 270-283 (1910). Bibl. footnotes.

THIELE, ALBRECHT. Oxalsäure. In *Abderhalden, Biochem. Handl.* 1: 1114-1123 (1911). 225 footnotes.

"Toxicology of oxalic acid." Ind.-Cat. S. G. O., 1st ser., 1: 87-88 (1880); 2nd ser., 1: 116 (1896); 3rd ser., 1: 122-123 (1918).

OXALURIC ACID

MEYER-JACOBSON. Oxalursäure. In *their Lehrb. org. Chem.* 1, pt. 2: 1401 (1913). Bibl. footnotes.

OXAZOLE COMPOUNDS

MEYER-JACOBSON. Oxazin-Körper. In *their Lehrb. org. Chem.* 2, pt. 3: 520-533 (1916). Bibl. footnotes.

OXAZINE COMPOUNDS

MEYER-JACOBSON. Oxazin-Körper. In *their Lehrb. org. Chem.* 2, pt. 3: 1454-1487 (1920). Bibl. footnotes.

OXIDASES

ATKINS, W. R. G. Oxydases and their inhibitors in plant tissues. *Sci. Proc. Roy. Soc. Dublin*, 14: 155-156, 168, 206 (1914). 48 references.

BACH, A. Neuere Arbeiten auf dem Gebiete der pflanzlichen und tierischen Oxydasen und Peroxydasen. *Biochem. Centr.* 9: 1-13, 73-87 (1909-1910). 122 references.

BEHRENS, J. Glykosidspaltung und Oxydasewirkungen. In *Lafar, Handb. tech. Mykologie* 1: 691-695 (1904-1907).

BUNZEL, HERBERT H. Measurement of the oxidase content of plant juices. *J. Am. Chem. Soc.* 34: 303 (1912). 30 references.

CLARK, ERNEST D. The plant oxidases. Thesis, Columbia Univ., 1910. 111 p. Bibl., p. 94-111.

KASTLE, J. H. The oxidases and other oxygen-catalysts concerned in biological oxidations. *U. S. Hyg. Lab., Bull. No. 59*, 1910. 164 p. Bibl., p. 141-161; 467 references.

LOELE, W. Histologischer Nachweis und biochemische Bedeutung oxydierender und reduzierender Substanzen innerhalb der Zelle. *Ergeb. allgem. Path.* 16, pt. 2: 760-766 (1912). 174 references.

"Oxidases." Ind.-Cat. S. G. O., 2nd ser., 12: 372 (1907).

OXIDASES—Cont'd

ROSE, D. H., KRAYBILL, H. R., and ROSE, R. C. Effect of salts upon oxidase activity of apple bark. *Bot. Gaz.* 69: 218-236 (1920). 33 references.

TSCHIRCH, A., and STEVENS, A. B. Ueber den Japanlak (Ki-urushi). *Arch. Pharm.* 243: 504-553 (1905). Bibl. footnotes.

ZUNZ, EDGARD. Oxydasen. In *Abderhalden, Biochem. Handl.* 5: 631-646 (1911). 260 footnotes.

See also ENZYMES.

OXIDATION

JORISSEN, W. P. De ontwikkeling van de denkbeelden op het gebied der oxydatierschijnselen. *Chem. Weekblad* 5: 741-744 (1908). Classified.

MANCHOT, W. Zur Theorie der Oxydationsprocesse. *Ann.* 325: 93-104 (1902). 38 references.

WIELAND, HEINRICH. Ueber den Mechanismus der Oxydationsvorgänge. *Ergeb. Physiol.* 20: 478-481 (1922). 86 references.

OXIDATION: Physiological.

ARKIN, AARON. The influence of chemical substances in immune reactions with special reference to oxidation. Thesis, Univ. Chicago, 1913. Reprinted from *J. Infectious Diseases* 11: 427-432 (1912); 13: 408-424 (1913). Bibl., p. 422-424.

DAKIN, H. D. Physiological oxidations. *Physiol. Rev.* 1: 419-420 (1921). 54 references.

DAKIN, H. D. Oxidations and reductions in the animal body. 2nd ed. New York, Longmans, 1922. 176 p. Bibl., p. 145-172.

ENRIGUEZ, E., and SICARD, J. A. Les oxydations de l'organisme. Paris, Bailliere, 1902. 87 p.

LOEWY, A. Das Gaswechsel der Organe, Gewebe und isolierten Zellen. In *Oppenheimer, Handb. Biochem., Ergänzungsband*, 1913, p. 183-247. 159 footnotes.

"Physiological oxidation." *Ind.-Cat. S. G. O.*, 1st ser., 10: 332 (1889); 2nd ser., 12: 373 (1907).

WIELAND, HEINRICH. Mechanismus der Oxydation und Reduktion in den lebenden Substanzen. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 2: 252-272 (1923). 64 footnotes.

OXIDES: Reduction.

WEISS, L., and AICHEL, O. Ueber die Reduktion von Metalloxyden mit Hilfe von Ceritmetallen. *Ann.* 357: 370-389 (1904). 53 footnotes.

OXONIUM THEORY

KNOX, JOSEPH, and RICHARDS, MARION B. The basic properties of oxygen

in organic acids and the quadrivalency of oxygen. *J. Chem. Soc.* 115: 508-531 (1919).

See also RADICALS, FREE.

OXYCELLULOSE. See CELLULOSE.**OXYGEN**

BASKERVILLE, CHARLES, and STEVENSON, RESTON. The chemistry of anesthetics. II. The examination of commercial oxygen. *J. Ind. Eng. Chem.* 3: 471-476 (1911). Bibl. footnotes.

FRIEND, J. N., and TWISS, DOUGLAS F. Oxygen. In *Friend, Textbook* 7, pt. 1: 10-137 (1924). Bibl. footnotes.

JÖRGENSEN, S. M. Die Entdeckung des Sauerstoffes. *Sammlung chem. chem.-tech. Vorträge* 14: 1-62 (1909). Bibl. footnotes.

MELLOR, J. W. Oxygen. In *his Inorg. theor. chem.* 1: 344-404 (1922). Discovery, 25 references; preparation, 150 references; physical properties, 250 references; chemical properties, 200 references.

"Oxygen." *Ind.-Cat. S. G. O.*, 1st ser., 10: 374-375 (1889) 2nd ser., 12: 332-335 (1907).

PRANDTL, W. Sauerstoff. In *Gmelin-Krant, Handb. anorg. Chem.* 1, pt. 1: 1-28 (1907).

SABATIER, P. Oxygène. In *Moissan, Chim. min.* 1: 191-216 (1904). 257 footnotes.

SANDER, A. Sauerstoff. In *Bräuer and d'Ans, Fortschritte* 1: 402-403 (1921). 54 German patents.

See also AIR, ATMOSPHERE, EXPLOSIVES (Howell), OZONE.

OXYHEMOGLOBIN

"Oxyhemoglobin." *Ind.-Cat. S. G. O.*, 2nd ser., 12: 378-379 (1907).

See also BLOOD PIGMENTS, HEMOGLOBIN.

OXYPINENES

BLOMEN, J. E. Some historical and bibliographical notes on the therapeutics and chemistry of the oxypinenes. *Am. J. Pharm.* 87: 398-406 (1915).

OZOKERITE

GOSLING, E. B. Ozokerite. *School Mines Quarterly* 16: 62-68 (1894). Chronological.

See also HYDROCARBONS, NATURAL; PETROLEUM (Redwood).

OZONE

DOWNEY, WM. E. Relation between the glow of phosphorus and the formation of ozone. *J. Chem. Soc.* 125: 348-349 (1924). 50 references.

ENGELHARDT, V. Ozon. In *Bräuer and d'Ans, Fortschritte* 1: 470-472 (1921). 61 German patents.

FISCHER, FRANZ, and MASSENEZ, KARL. Ueber die Darstellung von Ozon durch Elektrolyse. *Z. anorg. Chem.* 52: 202-218 (1907). 30 footnotes.

FRIEND, J. N., and TWISS, DOUGLAS F. Ozone. *In* Friend, Textbook 7, pt. 1: 138-155 (1924). Bibl. footnotes.

GRÄFENBERG, LEOPOLD. Beiträge zur Kenntniss des Ozons. *Z. anorg. Chem.* 36: 355-379 (1903). 70 footnotes.

HARRIES, C. Ueber die Einwirkung des Ozons auf organische Verbindungen. *Ann.* 343: 311-344 (1905). 57 footnotes.

JAHN, STEPHAN. Beiträge zur Kenntniss des Ozons. *Z. anorg. Chem.* 42: 203 (1904); 48: 260 (1906); 60: 292, 337 (1908). Bibl. footnotes.

LEEDS, ALBERT E. Index to the literature of ozone, 1785-1879. *Annals, N. Y. Acad. Sci.* 1: 373-404 (1880). Supplement. 1879-1883. *Ibid.* 3: 150-152 (1884). The latter is also in *Chem. News* 50: 215 (1884).

MELLOR, J. W. Ozone and hydrogen peroxide. *In his* *Inorg. theor. chem.* 1: 877-961 (1922). Discovery, 50 references; preparation, 300 references; occurrence, 50 references; physical properties, 120 references; chemical properties, 250 references; constitution, 50 references.

"Ozone." *Ind.-Cat. S. G. O.*, 1st ser., 10: 338-341 (1889); 2nd ser., 12: 388-390.

PRANDTL, W. Ozon. *In* *Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 1: 28-50 (1907).

SABATIER, P. Ozone. *In* *Moissan, Chim. min.* 1: 216-237 (1904). 218 footnotes.

VOSMER, A. Ozone, its manufacture, properties and uses. New York, Van Nostrand, 1916. 107 p. Bibl., p. 185-191. 140 references. Patents, p. 182-183.

See also OXYGEN.

PAINT

ANDES, LOUIS E. Ueber Neuerungen in der Fabrikation von Anstrichfarben. *Chem.-Ztg.* 24: 1062-1065 (1900); 73 footnotes. 25: 1035-1038 (1901); 30 footnotes. 26: 582-584 (1902); 42 footnotes. 27: 261-264 (1903); 61 footnotes.

HOLLEY, CLIFFORD D. Analysis of paint vehicles, japons and varnishes. New York, Wiley, 1920. 203 p. Bibl., p. 194-195.

JENNINGS, ARTHUR S. Paint and color mixing. London, Spon, 1902. 94 p. Bibl., p. 92-94.

MORRELL, R. S. Varnishes, paints and pigments. *In* Third report on colloid chemistry, 1920, p. 102-113. References through text.

SOCIETY OF CHEMICAL INDUSTRY. Paints, pigments, varnishes and resins. *In* Reports of the progress of applied chemistry 1: 180-196 (1916); 2: 322-326 (1917); 3: 286-297 (1918); 4: 300-314 (1919); 5: 309-331 (1920); 6: 330-352 (1921); 7: 228-307 (1922); 8: 319-346 (1923); 9: 328-373 (1924). Bibl. footnotes.

ZIMMER, E. Bleifarben. *In* *Bräuer and d'Ans, Fortschritte* 1: 3685-3688 (1923). German patents.

See also MINERAL PAINTS, VARNISHES, RESINS, ETC.

PAINT REMOVERS

MARSCHALK, —. Mittel zur Entfernung alter Lackanstriche, sog. Abbeizmittel. *Kunststoffe* 9: 19-23, 35-37 (1919). 145 patents.

SCHALL, M. Tabellarische Uebersicht ueber die Herstellung von Lack- und Farbenbeizen. *Kunststoffe* 6: 274-278, 293-296 (1916). Patents.

WORDEN, E. C. Paint and varnish removers. *In his* *Technology of cellulose esters* 1: 2562-2658 (1921). Bibl. footnotes.

PALLADIUM

AMBERG, RICHARD. Ueber chemische Eigenschaften und das Verbindungsgewicht des Palladiums. *Ann.* 341: 235-308 (1905). 127 footnotes.

CHAVANNE, —. Palladium. *In* *Moissan, Chim. min.* 5: 852-892 (1906). 174 footnotes.

FRIEND, J. N. Palladium. *In his* *Textbook* 9, pt. 1: 174-207 (1920). Bibl. footnotes.

GUTBIER, A., HUBER, J., and KRAUTER, J. Ueber kolloides Palladium. *Kolloid-Z.* 18: 65-71 (1916). 19 footnotes.

LEIDIÉ, E. Palladium. *In* *Frémy, Enc. chim.* 3, 17^e cahier: 135-144 (1901).

McKEEHAN, L. W. Crystal structure of the system palladium-hydrogen. *Phys. Rev.* 21: 339-342 (1923). 66 references, 1879-1921.

SIEVERT, ADOLF. Palladium and Wasserstoff. *Z. physik. Chem.* 88: 103-127, 451-478 (1914). Bibl. footnotes.

See also PLATINUM (Howe), RARE EARTHS.

PALMITIC ACID

SCHMIDT, E. Palmitinsäure. *In* *Abderhalden, Biochem. Handl.* 1: 1003-1008 (1911). 100 footnotes (includes derivatives).

See also ACIDS, ORGANIC; FATS, OILS, WAXES.

PANCREAS

LESSER, E. J. Pankreas und sein Sekret. In Oppenheimer, Handb. Biochem. 2nd ed., 4: 577-594 (1924). 118 footnotes.

MURLIN, JOHN R. Progress in the preparation of pancreatic extracts for the treatment of diabetes. Endocrinology 7: 519-535 (1923). 80 references.

"Pancreatic juices." Ind.-Cat. S. G. O., 1st ser., 10: 391-392 (1889); 2nd ser., 12: 450-453 (1907).

ROSENBERG, SIEGFRIED. Pankreas und sein Sekret. In Oppenheimer, Handb. Biochem. 3, pt. 1: 122-149 (1910); *Ergänzungsband*, 1913, 433-441. 190 footnotes.

ROSENBERG, SIEGFRIED. Pankreas und Glykolyse. In Oppenheimer, Handb. Biochem. 3, pt. 1: 245-270 (1910). 144 footnotes.

See also DIGESTION.

PAPAIN

"Papain." Ind.-Cat. S. G. O., 1st ser., 10: 400 (1889); 2nd ser., 12: 464-465 (1907).

See also ENZYMES.

PAPAVERINE

"Papaverine." In Merck's Annual reports 28: 74-94 (1914). Bibl. footnotes.

See also ALKALOIDS.

PAPER

BARBILLION, —. Paper research literature. V. A list of the contributions by the staff of L'Ecole Française de Papeterie. Paper 25, No. 23: 20-22 (Feb. 11, 1920).

CURTIS, F. A., and WEST, C. J. A list of contributions by members of the Bureau of Standards, Department of Commerce, 1910 to Dec. 31, 1922. Paper Trade J. 76, No. 6: 47-52 (Feb. 8, 1923). Earlier list appeared in Paper Trade J. 71, No. 19: 48 (Nov. 4, 1920).

DAVIS, CHARLES T. The manufacture of paper. Processes for fabrication, coloring and finishing of paper. Philadelphia, Baird, 1886. 608 p. Patents.

DICKINSON, MAUDE V. History of papermaking in the United States. Paper Trade J. 71, No. 21: 176, 178, 180, 182, 184, 186 (Nov. 18, 1920).

DUMERCY, CHARLES. Bibliographie de la Papeterie. Translated by Dard Hunter. Paper Trade J. 72, No. 11: 56, 58, 60, 62, 64, 66; No. 12: 54, 56, 58, 60, 62 (Mar. 10, 17, 1921).

GRIFFIN, R. B., and LITTLE, A. D. The chemistry of papermaking. New York, Lockwood, 1894. 517 p. Critical list of U. S. patents relating to

the sulfite process, 1857-1893, p. 471-477.

HALLE, —. Ueber Papier- und Zellstoffmassen. Kunststoffe 6: 269-273, 289-292, 304-311 (1916). 259 patents.

HERZBERG, WM. Paper research literature. VI. A list of the contributions by the staff of the Königliche Materialprüfungsamt zu Berlin-Lichterfelde West. Translated and augmented by C. J. West. Paper Trade J. 71, No. 17: 48, 50, 52, 54, 56, 58; No. 18: 52, 54, 56, 58, 60, 62, 64, 66, 68 (Oct. 21, 28, 1920).

HUBBARD, M. British patent office library accessions. A select bibliography of cellulose, paper and allied subjects. Paper 25: No. 4: 32, 34, 36, 38, 40, 41, 44, 46, 48, 50, 52; No. 9: 15-19; No. 10: 25 (Oct. 1, Nov. 5, 12, 1919).

HUBBARD, M. Forest products statistics. Adapted from a compilation of U. S. Central Bureau of Planning and Statistics. Appendix: Bibliographies of official publications. Paper 23, No. 26: 11-14; 26, No. 1: 15-17, 38 (Mar. 5, 12, 1919).

HUBBARD, M. Literature of the paper industry. A bibliography adapted from Akesson-Everling-Flückiger. Paper 21, No. 23: 54, 56, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80 (Feb. 12, 1919).

HUBBARD, M. L. C. card references for paper men. A descriptive book bibliography of the arts, technology and economics of paper. Compiled with extensive emendations from the Library of Congress printed index cards. Paper 26, No. 7: 150, 152-158, 160, 164, 168, 173-174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 196, 198, 200, 202, 204, 206, 208, 210; No. 8: 11-15, 25-28 (Apr. 21, 28, 1920).

HUNTER, DARD. The literature of papermaking, 1390-1800. Chillicothe, Ohio, Hunter, 1925. 47 p.

JURITZ, C. F. The grasses of the Eastern Coast Belt available for the manufacture of paper and the possibilities and prospects of papermaking in the Union of South Africa. Union South Africa, Indus. Bull. Ser., No. 7, 1919. 115 p.

LITTLE, ARTHUR D. Paper research literature. IV. A list of contributions by members of the laboratory of Arthur D. Little, Inc., Boston, Mass., 1889-1918. Paper 24, No. 17: 24-26 (July 2, 1919).

LOFTON, ROSCOE E. Photomicrography of paper fibers. U. S. Bur. Stan-

- dards, Tech. Paper No. 217, 1922. Bibl., p. 649-650.
- MATTHEWS, ETTA L. Paper research literature. I. A list of contributions by members of the U. S. Forest Service, Forest Products Laboratory: 1910-1918. With appendix of contributions by other members of the service, 1877-1918, by H. E. STOCKBRIDGE. Paper 24, No. 8: 259-264 (Apr. 30, 1919).
- MEYER, H. H. B. Paper manufacture. Paper Trade J. 72, No. 13: 56, 58, 60, 62, 64, 66; No. 14: 50, 52, 54, 56, 58; No. 15: 48, 50, 52, 54, 56, 58, 60 (Mar. 24, 31, Apr. 7, 1921).
- "Paper bibliography." Contents of the Patent Office Library. World's Paper Trade Rev. 76: 424, 426, 428, 520, 522, 524, 526, 606, 608, 610, 688, 690 (July 29, Aug. 5, 12, 19, 1921).
- REED, EDWARD O. Paper research literature. III. A list of contributions by members of the U. S. Bureau of Chemistry, 1904-1918. Paper 24, No. 13: 15-16 (June 4, 1919).
- SCHWALBE, CARL G. Auszüge aus der Literatur der Zellstoff und Papierfabrikation (Chemischer Teil). Verlag des Vereins des Zellstoff- und Papier-Chemiker. Issued annually from 1909 to 1920. The material is classified and each volume has subject and author index. It was usually published in one or more of the German paper magazines in quarterly installments. The bibl. now appears in Zellstoff und Papier.
- SMITH, EVA M. Paper research literature. II. A list of contributions by members of the Forest Products Laboratories of Canada: 1913-1918. With appendix of contributions by other members of the Canadian Forestry branch. Paper 24: No. 9: 15-16 (May 7, 1919).
- STOCKBRIDGE, HELEN E. Government paper bibliography: United States government publications pertaining to pulp and paper. Supplement No. 1. Paper 22, No. 11: 38, 40 (May 22, 1918).
- SURFACE, HENRY E. Bibliography of the pulp and paper industries. U. S. Dept. Agr., Forest Service, Bull. No. 123, 1913. 48 p. Alphabetical by authors.
- SURFACE, HENRY E. United States government publications pertaining to pulp and paper. Paper 19, No. 4: 25-30 (Oct. 4, 1920). 2nd ed. of bibl. appearing in J. Ind. Eng. Chem. 5: 614-616 (1913).
- TECHNICAL SECTION, Papermakers' Association of Great Britain and Ireland. Bibliography of periodical publications on papermaking and allied subjects. 1920. 40 p. 1921, 47 p. 1922, 37 p. Classified.
- TEXTOR, CLINTON K. Sulfate pulp and kraft paper. List of references covering the literature up to 1912. Paper Trade J. 73, No. 4: 46+; No. 6: 46+; No. 7: 54+ (July 28, Aug. 11-18, 1921).
- WEST, CLARENCE J. The sizing of paper. Paper Trade J. 71, No. 20: 50, 52, 54, 56; No. 21: 110, 112, 114, 116 (Nov. 11, 18, 1920).
- WEST, CLARENCE J. The bleaching of paper pulp. Paper Trade J. 71, No. 24: 36, 38, 40, 42, 48 (Dec. 9, 1920).
- WEST, CLARENCE J. Papermaking materials. Paper Trade J., 71: Nos. 25-26; 72: Nos. 1-10 (1920-1921). Reprinted as Bibliographic Series No. 6. A. D. Little, Inc., Cambridge, Mass. 1921. 170 p.
- WEST, CLARENCE J. The dyeing of pulp and paper. Paper Trade J. 72, No. 20: 46, 48, 50, 52, 54, 58 (May 12, 1921).
- WEST, CLARENCE J. Clay in the paper industry. Paper Trade J. 72, No. 23: 52, 54, 56 (June 2, 1921).
- WEST, CLARENCE J. Recent literature on soda and sulfate pulps. Paper Trade J. 73, No. 16: 46+; No. 17: 42+ (Oct. 20-27, 1921).
- WEST, CLARENCE J. Beating and refining. In The manufacture of pulp and paper, 4, sect. 3: 71-77 (1924).
- WEST, CLARENCE J. Paper research literature. I. revised. A list of the contributions of the members of the Forest Products Laboratory on pulp and paper. Paper Trade J. 77, No. 7: 46-50 (Aug. 16, 1923).
- WEST, CLARENCE J. Rubber latex in papermaking. Paper Trade J. 79, No. 7: 45-46 (Aug. 14, 1924).
- WEST, CLARENCE J. Chlorine in the manufacture of paper pulp. Paper Trade J. 79, no. 12: 43-44 (Oct. 2, 1924).
- WEST, CLARENCE J. Bibliography of papermaking, 1920, 1921. Paper 28, No. 7: 164+ (Apr. 20, 1921). 21 p. Paper Trade J. 74: Nos. 16-20 (Apr. 20, May 18, 1922); Tech. Assoc. Papers 5: 96-114 (1922).
- WEST, CLARENCE J., and PAPINEAU-COUTURE, A. Bibliography of papermaking for 1922, 1923. Paper Trade J. 76: Nos. 16-26 (1923); Tech. Assoc. Papers 6: 119-148 (1923). Paper Trade J. 78: Nos. 17-25 (1924); Tech. Assoc. Papers 7: 106-132 (1924).

PAPER—Cont'd

WEST, CLARENCE J., and PAPINEAU-COUTURE, A. Bibliography of paper-making for 1924. *Paper Trade J.* 80, nos. 8-16 (1925).

Serial

Paper makers' monthly journal. London. Since Apr., 1912, there has appeared a bibl. of current paper trade literature, covering the most important magazines, classified as follows: General, raw materials, testing, chemistry of papermaking, papermaking machinery.

Papierfabrikant. Berlin. Publishes abstracts of the more important articles on papermaking.

Technical association of the pulp and paper industry. This association prepares, in cooperation with the Canadian association, abstracts of all material relating to papermaking; these are published in *The Paper Trade Journal*, *The Pulp and Paper Magazine of Canada* and the *Paper Mill*.

Zellstoff und Papier. 1921-. This magazine publishes a bibl. of papermaking in quarterly installments but it is limited by the fact that it is confined to German literature. Before 1921, this bibl. was published in various German magazines and then reprinted as a separate. Abstracts are very brief.

PAPER: Analysis.

HERZBERG, WILHELM. *Papierprüfung, eine Anleitung zum Untersuchen von Papier*. Berlin, Springer, 1915. 276 p. Bibl., p. 260-273.

"Paper testing." *In* *The manufacture of pulp and paper*, 5, pt. 5: 72-79 (1925).

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Paper testing methods; microscopical, chemical, and physical processes described with the apparatus employed. New York, 1922. 39 p. Bibl., p. 38-39.

PAPER: Blotting.

WEST, C. J. Blotting paper. *Paper Trade J.* 71, No. 22: 48, 50, 52 (Nov. 25, 1920).

PAPER: Cigarette.

WEST, CLARENCE J. Special papers. III. Cigarette paper. *Paper Trade J.* 72, No. 25: 44+ (June 2, 1921).

PAPER: Deterioration.

LYDENBURG, H. M. Bibliography of paper deterioration. *Paper* 22, No. 19: 12-13 (July 17, 1918).

PAPER: Filter.

WEST, CLARENCE J. Filter paper; a reading list. *Paper Trade J.* 71, No. 15: 34, 36, 38, 40 (Oct. 7, 1920).

PAPER: Handmade.

HUNTER, DARD. Handmade paper and its watermarks. *Paper* 20, No. 12: 20-26 (May 30, 1917).

PAPER: Marbled.

HUNTER, DARD. A bibliography of marbled paper. *Paper Trade J.* 72, No. 18: 52+ (Apr. 28, 1921).

PAPER: Periodicals.

CLARK, F. C., and WEST, C. J. American and foreign paper trade periodicals; a list of subscribers. *Paper* 21, No. 4, 90+ (Oct. 3, 1917); revised in *Paper Trade J.* 76, No. 4: 45-49 (Jan. 25, 1923).

PAPER: Roofing.

MARSCHALK, —. Herstellung von Dachpappe und Dachpappeanstrichen nach der Patentliteratur in tabellarische Uebersicht. *Kunststoffe* 10: 5-7, 27-30 (1920). 91 patents.

PAPER TEXTILES

WEST, CLARENCE J. Reading list on paper yarns and textiles. *Paper Trade J.* 72, No. 22: 42+ (May 26, 1921). About 125 references.

PARABANIC ACID

BILTZ, HEINRICH, and TOPP, ERNST. Synthese der Parabansäure und substituierter Parabansäure. *Ber.* 46: 1387-1404 (1913). 40 footnotes.

BRAHM, C. Parabansäure. *In* Abderhalden, *Biochem.* *Handl.* 4: 1156-1158 (1911). Bibl. footnotes.

MEYER-JACOBSON. Parabansäure. *In* *their* *Lehrb. org. Chem.* 2, pt. 3: 463-464 (1916). Bibl. footnotes.

PARAFFIN

CAMPBELL, A., and WILSON, W. J. Paraffin wax and its manufacture. *J. Inst. Petroleum Tech.* 5: 128-130 (1919). 50 references. Supplements Redwood, 3rd ed.

"Paraffin." *Ind.-Cat. S. G. O.*, 1st ser., 10: 409-410 (1889); 2nd ser., 12: 473-475 (1907).

See also HYDROCARBONS, PETROLEUM.

PARALACTIC ACID

THIELE, A. Fleischmilchsäure. Paramilchsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1067-1072 (1911). 125 footnotes.

See also LACTIC ACID.

PARASITES

WELLS, H. G. Chemistry of the animal parasites. *In* *his* *Chem. Pathology*, 4th ed., 1920, p. 128-137. 80 footnotes.

PARATHYROID

BOOTHBY, WALTER M. The parathyroid gland. *Endocrinology* 5: 426-440 (1921). Chronological, from 1851-1920.

SIMPSON, SUTHERLAND. Physiology, physiological chemistry and experimental pathology (of the parathy-

roid glands). In Barker, Endocrinology and metabolism, 1: 509-555; references, 5: 91-114 (1922).

PARSLEY. See OLEORESINS.

PARTITION COEFFICIENTS

LANDOLT-BÖRNSTEIN. Verteilungskoeffizienten. In *their* Tabellen, 4th ed., 1912, 587; 5th ed., 1923, 749-750. 65 references.

PASSIVITY

BENNETT, C. W., and BURNHAM, W. S. The passive state of metals. Trans. Am. Electrochem. Soc. 29: 217-268 (1916); J. Phys. Chem. 21: 110-112 (1917). 200 references.

BRUNET, LOUIS. L'état actuel de la question de la passivité des métaux. Rev. gén. chim. pure appl. 17: 66-72 (1914). Bibl. footnotes.

BYERS, H. G. Passive state of metals. J. Am. Chem. Soc. 30: 1718-1742 (1908). 100 references.

BYERS, HORACE G., and LANGDON, SETH C. Relation between the magnetic field and the passive state of iron. J. Am. Chem. Soc. 35: 759 (1913). 40 references.

HEATHCOTE, HENRY L. The passivifying, passivity and activating of iron. J. Soc. Chem. Ind. 26: 915-917 (1907). 204 references.

MULLER, ERICH, and SPITZER, FRITZ. Ueber anodische Oxydbildung und Passivität. Z. anorg. Chem. 50: 321-355 (1906). 70 footnotes.

REICHSTEIN, G. Passivity of metals. Trans. Faraday Soc. 9: 228-246 (1914). 25 footnotes.

SENER, G. Passivity of metals. Trans. Faraday Soc. 9: 203-213 (1914). 30 references.

PATENTS

SMITH, JULIAN F. Patent reference sources. Ind. Eng. Chem. 16: 527-528 (1924).

WORDEN, EDWARD C. Patent index. A card index to United States chemical and industrial patents issued since 1900, comprising more than 1,800,000 references. The index is open for consultation without charge during office hours by appointment. Arrangements can also be made to obtain typed lists bearing on specified subjects. The index is described by PAYNE, Chem. Met. Eng. 32: 17 (1925).

PATHOLOGY: Chemical.

"Chemical pathology." Ind.-Cat. S. G. O., 2nd ser., 12: 665-666 (1907).

WELLS, H. GIDEON. Chemical pathology, being a discussion of general pathology from the standpoint of the chemical processes involved. 4th ed. Philadelphia, Saunders, 1920.

695 p. Bibl. footnotes and numerous references to bibls. on various topics.

PEAT

BASTIN, EDSON S., and DAVID, C. A. Peat deposits of Maine. U. S. Geol. Sur., Bull. No. 376, 1909. 127 p. Bibl., p. 123-124. 32 references.

BJORLING, PHILIP R., and GISSING, F. T. Peat, its manufacture and use. London, Griffin, 1907. 173 p. Bibl., p. 156-160. 125 references. Patents, p. 161-165, covering 1900-1907.

DACHNOWSKI, ALFRED P. Quality and value of important types of peat material. A classification of peat based upon its botanical composition and physical and chemical characteristics. U. S. Dept. Agr., Bull. No. 802, 1919. 40 p. Bibl., p. 39-40.

DAVIS, C. A. Peat. Essays on its origin, uses and distribution in Michigan. Mich. Geol. Sur., Rept., 1906. 395 p. Bibl., p. 173-179. 113 references, 1802-1907.

DAVIS, C. A. The use of peat for fuel and other purposes. U. S. Bur. Mines, Bull. No. 16, 1911. 214 p. Bibl., p. 204-205. 58 references.

ECHÉ, CH. v. Exploitation industrielle de la tourbe. Paris, Dunod, 1918. Bibl., p. 352-363. 170 books.

GISSING, F. T. Commercial peat, its uses and possibilities. Philadelphia, Lippincott, 1910. 191 p. Bibl., p. 163-169; patents, p. 170-176.

HARPER, ROLAND. Preliminary report on the peat deposits of Florida. Florida State Geol. Sur., 3rd Annual Rept., p. 359-366 (1910). 82 references, 1823-1910.

HAUSDING, A. Handbook on the winning and utilization of peat. Gt. Brit., Dept. Sci. Ind. Res., 1921. 506 p. Patents, p. 481-494.

HOLMES, J. A., *et al.* Preliminary report on the operation of the fuel testing plant of the U. S. Geol. Sur., St. Louis, Mo., 1905. U. S. Geol. Sur., Bull. No. 290, 1906. 240 p. Bibl. of peat and its utilization, p. 11-16.

HUELS, FREDERICK W. The peat resources of Wisconsin. Wis. Geol. Sur., Bull. No. 45, 1915. 274 p. Bibl., p. 264-266. 61 references.

LEES, J. H. Peat deposits in Iowa. Iowa Geol. Sur. 19: 689-733 (1909). Bibl., p. 731-733. 63 references.

MCCOURT, W. E. Distribution of peat in Northern New Jersey. N. J. Geol. Sur., Ann. Rept., 1905, p. 309-313. 140 references.

PARSONS, A. L. Peat: its formation, uses and occurrence in New York. N. Y. State Museum, 57th Rept., 1:

PEAT—Cont'd

85-88 (1905); 23rd Annual Rept. State Geol., 85-88 (1903). 87 references.

RYAN, HUGH. Report upon the Irish peat industries. Econ. Proc. Royal Dublin Soc. 1: 534-546 (1908). Classified.

SOPER, E. K. The peat deposits of Minnesota. Minn. Geol. Sur., Bull. No. 16, 1919. 261 p. Bibl., p. 254-256. 69 references.

Serial

Jahrbuch der Moorkunde. Bericht über die Fortschritte auf allen Gebieten der Moorkultur und Torfverwertung. 1912-. . . Contains abstracts. Journal of the American Peat Society. 1908-. . . "Contains abstracts on all contemporary literature and patents" relating to peat and its use.

See also COAL, FUELS.

PECTIN

CZAPEK, F. Die Pektinsubstanzen. In *his* Biochemie der Pflanzen, 3rd ed., 1: 665-672 (1922). Bibl. footnotes.

DORE, W. H. Recent progress in the chemistry of pectin and its industrial applications. Ind. Eng. Chem. 16: 1044 (1924). 16 references.

GRAFE, VIKTOR. Pektinstoffe. In *Abderhalden*, Biochem. Handl. 2: 80-94 (1911); 8: 18-20 (1914). About 130 references.

McNAIR, JAS. B. The consistency of pectin gels. J. Phys. Chem. 20: 639 (1916). 9 references.

PECTINASE

HARTER, L. L., and WEIMER, J. L. Influence of the substrate and its hydrogen ion concentration on pectinase production. J. Agr. Res. 24: 877-878 (1923).

See also ENZYMES.

PENTAMETHYLENE GROUP

MEYER-JACOBSON. Die Pentamethylen- oder Cyclopentangruppe. In *their* Lehrb. org. Chem. 2, pt. 1: 25-36 (1895).

PENTANE

BAUM, FRITZ. Pentan. In *Abderhalden*, Biochem. Handl. 1: 89-93 (1911). 85 footnotes (includes derivatives).

See also HYDROCARBONS.

PENTATHIONIC ACID

LINNE, BR. Pentathionsäure, $H_2S_5O_6$. In *Gmelin-Kraut*, Handb. anorg. Chem. 1, pt. 1: 609-614 (1907).

PENTOSANS

CZAPEK, F. Hemicellulosen und Pentosane der Zellwand. In *his* Biochemie der Pflanzen, 3rd ed., 1: 654-665 (1922). Bibl. footnotes.

GRAFE, VIKTOR. Pentosane. In *Abderhalden*, Biochem. Handl. 2: 60-65 (1911); 8: 10-15 (1914). About 150 footnotes.

STEENBERGEN, H. D. De bespaling der pentosanen. Chem. Weekblad 15: 784-808 (1918). Bibl. footnotes.

PENTOSSES

MEYER-JACOBSON. Pentosen. In *their* Lehrb. org. Chem. 1, pt. 2: 947-960 (1913). Bibl. footnotes.

"Pentososes." Ind.-Cat. S. G. O., 2nd ser., 12: 797-798 (1907).

See also CARBOHYDRATES, names of the individual sugars.

PENTOSURIA

NEUBERG, CARL. Die Physiologie der Pentosen und der Glukuronsäure. Ergeb. Physiol. 3: 373-379 (1904). 292 references.

"Pentosuria." Ind.-Cat. S. G. O., 2nd ser., 12: 798 (1907).

WOHLGEMUTH, J. Zur Pentosefrage. Biochem. Centr. 1: 533-536 (1902). 41 references.

PEPPERS

TOLMAN, L. M., and MITCHELL, L. C. Composition of different varieties of red peppers. U. S. Dept. Agr., Bur. Chem., Bull. No. 163, 1913. 32 p. Bibl., p. 30-32.

See also OLEORESINS.

PEPSIN

BANG, IVAR. Labgerrinnung und Lab. Ergeb. inneren Medizin 9: 435 (1912). 37 references.

EFFRONT, J. "Bibliography on pepsin." In *his* Biochemical catalysts in life and industry, p. 262-271 (1917).

GLAESSNER, KARL. Pepsin und Pepsinverdauung. Biochem. Centr. 2: 177-185 (1903). 75 references.

"Pepsin." Ind.-Cat. S. G. O., 1st ser., 10: 678-679 (1889); 2nd ser., 12: 801-802 (1907).

ROSS, VICTOR. On the mode of action of pepsin, with special emphasis on the influence of the concentration of the "intermediate product" on the velocity of digestion. Thesis, Columbia Univ., 1923. 27 p. Bibl., p. 25-26.

VAHLTERICH, H. W., and GLOVER, C. C. Pepsin—methods used for its quantitative estimation—its permanence and effectiveness of some of its preparations. J. Am. Pharm. Assoc. 10: 595-605 (1921). 29 references.

WALDSCHMIDT, WILHELM. Ueber die verschiedenen Methoden, Pepsin und Trypsin quantitative zu bestimmen, nebst Beschreibung einer einfachen derartigen Methode. Arch. ges. Physiol. 143: 189-229 (1911-1912). Bibl. footnotes.

ZUNZ, EDGARD. Pepsinase. *In* Abderhalden, Biochem. Handl. 5: 580-587 (1911). 160 footnotes.

See also ENZYMES; MILK, COAGULATION.

PEPTISATION

BANCROFT, WILDER D. Report on peptisation and precipitation. *In* Second report on colloid chemistry, 1918, p. 2-16. 89 footnotes.

See also COLLOIDS.

PEPTONES

LANGSTEIN, LEO. Peptone. Biochem. Centr. 2: 97-100 (1902). 24 references.

"Peptones." Ind.-Cat. S. G. O., 1st ser., 10: 679-681 (1889); 2nd ser., 12: 803-805 (1907).

SIEGFRIED, M., and WEIL, A. Peptone und Kyrine. *In* Abderhalden, Biochem. Handl. 4: 198-206 (1910); 9: 33-35 (1915). About 65 footnotes.

See also PROTEINS.

PER ACIDS

GIRSEWALD, C. Anorganische Peroxyde und Persalze. Braunschweig, Vieweg, 1914. 98 p. Bibl. footnotes.

PRICE, T. SLATER. Per-acids and their salts. New York, Longmans, 1912. 123 p. Bibl., p. 111-119.

See also names of individual acids.

PERBROMIC ACID

MELLOR, J. W. Perbromic acid and the perbromates. *In* his Inorg. theor. chem. 2: 384-395 (1922). 200 references.

PERCHLORIC ACID

DITZ, HUGO. Perchlorsäure, HClO_4 . *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 152-161 (1909).

GOODWIN, H. M., and WALKER, E. C. The electrolytic oxidation of hydrochloric acid to perchloric acid. Chem. Met. Eng. 25: 1095 (1921). Bibl. footnotes.

MELLOR, J. W. Perchloric acid and the perchlorates. *In* his Inorg. theor. chem. 2: 370-384 (1922). 300 references.

WILLARD, H. H., and SMITH, G. F. The perchlorates of the alkali and alkali earth metals and ammonium. Their solubility in water and other solvents. J. Am. Chem. Soc. 45: 286 (1923). 30 references.

PERFUMES

CHARABOT, EUGÈNE T. Industrie des parfums naturels. Les principes odorants des végétaux (méthodes de dosage, d'extraction, d'identification). Paris, Doin, 1912. 388 p. Bibl., p. 375-376.

MANN, H. Die moderne Parfümerie. Eine Anweisung und Sammlung von Vorschriften zur Herstellung sämt-

licher Parfümerien und Kosmetika unter besonderer Berücksichtigung der künstlichen Riechstoffe, nebst einem Anhang ueber die Parfümierung der Toilettseifen. 3rd ed. Augsburg, Ziolkowsky, 1912. 609 p. Bibl., p. 585-593.

"Perfumes." Ind.-Cat. S. G. O., 1st ser., 10: 691 (1889); 2nd ser., 12: 812-813 (1907).

SATIE, C. [Chemistry of perfumes since 1914.] Chimie & Industrie 2: 271-280; 393-408 (1919).

See also ESSENTIAL OILS.

PERHALIDES

MELLOR, J. W. Perhalides or polyhalides. *In* his Inorg. theor. chem. 2: 233-239 (1922). 100 references.

PERIODIC ACID

DITZ, HUGO. Perjodsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 364-373 (1909).

MELLOR, J. W. Periodic acid and periodates. *In* his Inorg. theor. chem. 2: 386-395, 406-418 (1922). 175 references.

PERIODIC LAW

BRAUNER, BOHUSLAV. Ueber die Stellung der Elemente der seltenen Erden im periodischen System nach Mendelejeff. Z. anorg. Chem. 32: 1-30 (1902). 49 footnotes.

PANETH, FRITZ. Das periodische System der chemischen Elemente. Ergeb. exakten Naturwiss. 1: 400-403 (1922). 116 references.

RUDOLF, GEORG. Das periodische System, seine Geschichte und Bedeutung für die chemische Systematik. Hamburg, Voss, 1904. 370 p. Bibl., p. 247-249.

VENABLE, FRANCIS P. Development of the periodic law. Easton, Chem. Pub. Co., 1896. 321 p. Bibl., p. 285-308.

PERMANGANIC ACID

EPHRAIM, F. Permangansäure, Uebermangansäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 263-269 (1908).

PERMEABILITY

DENNY, F. E. Permeability of certain plant membranes to water. Bot. Gaz. 63: 395-397 (1917). 30 references.

HOBER, RUDOLF. Der Permeabilität der Zellen und Theorien der Permeabilität. Die Permeabilität der Gewebe. *In* his Physikalische Chemie der Zelle und der Gewebe, 4th ed., 1920, p. 349-445; 606-662. Bibl. footnotes.

SHULL, CHARLES A. Semipermeability of seed coats. Bot. Gaz. 56: 197-199 (1913). 36 references.

PERMEABILITY—Cont'd

STILES, WALTER. Permeability. London, Wheldon, 1924. 296 p. Bibl., p. 258-291. 817 references.

See also OSMOTIC PRESSURE.

PERMUTIT

ROTHMUND, V., and KORNFELD, G. Der Baschenaustausch im Permutit. Z. anorg. allgem. Chem. 103: 160-163 (1919).

PERNICIOUS ANEMIA See ANEMIA.**PERONIN**

"Peronin." Ind.-Cat. S. G. O., 2nd ser., 13: 115 (1908). 15 references.

PERSPIRATION

MELZNER, R. Die Absonderung des Hauttals und des Schweisses. In Nagel, Handb. der Physiologie des Menschen, 2: 406-410 (1907). Bibl. footnotes.

TALBERT, GEORGE A. The hydrogen ion and ash of human sweat produced by heat and work. Am. J. Physiol., 51: 442; 61: 500; 63: 357 (1919-1923). Thesis, Univ. Chicago, 1921.

PERSULFURIC ACID

LINNE, BR. Perschwefelsäure, $H_2S_2O_8$. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 558-567 (1907).

PETROLATUM

HANCE, S. S. Examination of vaselin and petrolatum. Proc. Mich. State Pharm. Assoc. 5: 192-193 (1887).

PETROLEUM

BURROUGHS, E. H. Bibliography of petroleum and allied substances. U. S. Bur. of Mines, Bull. No. 149, 1918. 147 p. 1455 references. Bull. No. 165, 1919. 159 p. 1357 references. Bull. No. 180, 1920. 170 p. 1489 references. Bull. No. 189, 1921. 180 p. 1725 references. Bull. No. 216, 1923. 374 p. 4532 references. Bull. No. 220, 1923. 230 p. 2703 references. Classified. Includes properties, their determination, refining, utilization. Author and subject index. Between Nov., 1919, and Apr., 1922, this was also issued monthly in the Reports of Investigation series; the following numbers were issued: 2044, 2062, 2075, 2085, 2093, 2108, 2120, 2132, 2146, 2155, 2168, 2172, 2188, 2198, 2210, 2222, 2241, 2252, 2261, 2269, 2271, 2305, 2317, 2330, 2340, 2348.

CADMAN, JOHN. Notes on the development of the Trinidad oil fields. J. Inst. Petroleum Tech. 1: 112-116 (1914). 100 references.

CAMPBELL, A. "Current bibliography." J. Inst. Petroleum Tech. 7: No. 1, and succeeding numbers.

CAMPBELL, ANDREW. Petroleum refining. London, Griffith, 1922. 297 p. Bibl., p. 223-282. Classified.

CLAPP, FREDERICK G. The occurrence of petroleum. In Day, Handbook of the petroleum industry 1: 1-166 (1922). References arranged by states and countries.

CROSS, ROY. Handbook of petroleum, asphalt and natural gas. Bull. No. 15, Kansas City Testing Lab. 1919. 496 p. U. S. Petroleum patents, p. 439-458. Books, 459-460. U. S. and state publications, p. 461-466. 1924 revision. Bibl., p. 705-711.

DAY, DAVID T. Characteristics of petroleum. In his Handbook of the petroleum industry, 1: 457-586 (1922). Refers especially to the hydrocarbons of petroleum.

DAY, DAVID T. Petroleum and natural gas. Mineral Ind. 26: 515-516 (1917); 27: 550-552 (1918). 100 references.

DAY, DAVID T. Survey publications, 1910-1914, on the oil fields of the United States. U. S. Geol. Sur., Mineral Resources, 1914, pt. 2: 1093-1098. 106 references.

EHRLHARDT, UDO. Ueber die synthetische Gewinnung von Mineralölen aus Gasen. Ges. Abh. Kennt. Kohle 4: 471-506 (1919). Bibl. footnotes.

ENGLER, C., and HÖFER, H. v. Das Erdöl, seine Physik, Chemie, Geologie, Technologie und sein Wirtschaftsbetrieb. Leipzig, Hirzel, 1913-1916. 5 vols. Bibl. footnotes.

GOODWIN, H. M., and ELLIS, RISDALE. The separation of oil from condenser water by electrolysis. Trans. Am. Electrochem. Soc. 27: 421-423 (1915). 56 references.

GURWITSCH, L. Chemie und Technologie des Erdöls. Z. angew. Chem. 22: 1061-1070 (1909); 85 footnotes. 23: 1299-1306, 1353-1359 (1910); 129 footnotes. 24: 1249-1256 (1911); 81 footnotes. 25: 1897-1904, 1948-1953 (1912); 127 footnotes. 26: 377-385 (1913); 96 footnotes. 27: 441-447 (1913); 108 references.

GR. BRIT. Imperial Institute, London. Mineral resource committee. Petroleum. London, Murray, 1921. 110 p. Bibl., p. 90-110.

HÖFER, HANS v. Das Erdöl und seine Verwandten. Braunschweig, Vieweg, 1912. 351 p. Bibl. footnotes.

HOLDE, D. Chemie und Technologie des Erdöls und verwandter Mineralöle. Chem. Z. 1: 283-285, 308-311, 341-342, 606-608, 627-629 (1902); 78 footnotes. 2: 148-151, 341-343, 369-371, 536-538, 608-609

- (1903); 75 footnotes. 3: 233-237, 478-481 (1904); 50 footnotes.
- KEWLEY, JAMES. The petroleum and allied industries; petroleum, natural gas, natural waxes, asphalt and allied substances, and shale oil. London, Baillière, 1922. 302 p. Contains bibls.
- KISSLING, RICHARD. Die Erdöl Industrie. Chem.-Ztg. 24: 605-607 (1900); 55 footnotes. 25: 486-488 (1901); 65 footnotes. 26: 490-492 (1902); 65 footnotes. 27: 366-369 (1903); 68 footnotes. 28: 540-544 (1904); 70 footnotes. 29: 405-408 (1905); 50 footnotes. 30: 659-662 (1906); 76 footnotes. 31: 604-606, 616-618 (1907); 103 footnotes. 32: 849-850, 867-868, 879-880 (1908); 163 footnotes. 33: 461-462, 471-472 (1909); 102 footnotes. 34: 961-962, 969-972 (1910); 205 footnotes. 35: 861-862, 879-880 (1911); 134 footnotes. 36: 1009-1011, 1040-1041, 1056-1057, 1087-1088 (1912); 304 footnotes. 38: 1273-1276, 1284-1286, 1290-1293 (1914); 313 footnotes. 40: 713-715, 735-738, 759-760, 782-784 (1916); 263 footnotes. 43: 897-899, 905-909, 913-917 (1919); 351 footnotes. 44: 569-571, 577-579, 590-591 (1920); 188 footnotes. 45: 1121-1122, 1145-1147, 1169-1170, 1173-1174, 1197-1199 (1921); 242 footnotes. 46: 1113-1114, 1129-1133, 1137-1140, 1153-1156, 1165-1168 (1922); 459 footnotes.
- KLAUDY, JOS. Die Mineralöle und verwandte Produkte im II Halbjahre 1904. Chem. Z. 4: 324-328, 343-345, 364-367 (1905); 101 footnotes.
- KOETSCHAU, RUDOLPH. Kolloidchemie und Erdölindustrie. Kolloid-Z. 31: 314-319 (1922). 29 footnotes.
- LESLIE, E. H. Composition of petroleum. In *his* Motor fuels, p. 36-55. 1923. Bibl. footnotes and bibl., p. 54-55.
- LESLIE, E. H. Cracking processes. In *his* Motor fuels, p. 328-397 (1923). 69 footnotes and bibl., p. 395-397.
- MCLAUGHLIN, R. P., and WARING, C. A. Petroleum industry of California. Calif. State Mining Bur., Bull. No. 69, 1914. 519 p. Bibl., p. 497-508.
- MARCUSSON, J. Die optisch aktiven Bestandteile des Erdöls. Chem.-Ztg. 32: 377-378, 391 (1908). 38 footnotes.
- MEXICO. Departamento de petróleo. Boletín del petróleo. Vol. 1, 1916. Each issue contains a section headed "Bibliografía."
- MUNROE, CHARLES. Petroleum refining. In Bureau of Commerce, Bull. No. 70, 1907. Digest of U. S. patents relating to petroleum refining, p. 29-57.
- PECKHAM, STEPHEN F. List of books, papers and references on rock oil and gas. Extracted from U. S. Census report, 1880, vol. x, p. 281-290. In Pa., Geol. Sur., Annual Rept., 1886, 2: 828-895. Based on a bibl. of petroleum prepd. by B. S. Lyman in 1875.
- "Petroleum." Ind.-Cat. S. G. O., 1st ser., 10: 1042-1043 (1889); 2nd ser., 13: 146-147 (1908).
- Polish and German bibliography of the Galician petroleum industry, 1875-1922. J. Inst. Petroleum Tech. 8: 666-687 (1922).
- RAKUZIN, M. A. Die moderne Adsorptionslehre in ihrer Bedeutung für die Chemie und Technologie des Erdöls. Petroleum Z. 20: 1695-9, 1761-6 (1924). Bibl. footnotes.
- REDWOOD, BOVERTON. Petroleum: a treatise on the geographical distribution and geological occurrence of petroleum and natural gas; the physical and chemical properties, production and refining of petroleum and ozokerite; the characters and uses, testing, transport and storage of petroleum products; and the legislative enactments relating thereto. 4th ed. London, Griffin, 1922. 3 vols. Bibl., compiled by W. H. Dalton, L. V. Dalton, S. L. James and E. S. Ward, vol. 3: 1155-1317. 8804 references, alphabetically by authors with subject index. Contains references to asphalt, cersin, naphthenes, ozokerite, etc.
- ROGERS, G. SHERBURNE. Relation of sulfur to variation in the gravity of California petroleum. Trans. Am. Inst. Mining Eng. 57: 989-1005 (1918). 35 footnotes.
- SADTLER, S. P., and MATOS, L. J. Mineral oils and allied bitumens. In *their* Industrial organic chemistry, 1923, p. 56-57. Books only.
- SAN FRANCISCO. Mechanics' institute. Library. Literature available in the library on petroleum with some references on asphaltum. Prepared by F. J. Teggart. San Francisco, 1903. 24 p.
- SINGIER, LEOPOLD. Ueber Neuerungen auf dem Gebiete der Mineralölanalyse und Mineralölfabrikation. Chem. Rev. Fett-Harz-Ind. 9: 45, 71, 98, 120, 146, 174 (1902); 10: 29, 47, 68, 93, 118, 144, 169, 194, 227 (1903); 11: 28, 46, 71, 94, 120, 142, 170, 196,

PETROLEUM—Cont'd

220, 248, 268 (1904); 12: 49, 68, 102, 128, 154, 178, 209, 233, 265, 288 (1905); 13: 74, 105, 134, 158, 182 (1906); 14: 52, 78, 107, 133, 162 (1907); 16: 189, 213, 243, 268, 295 (1909); 17: 98, 127, 154, 175, 212, 237, 256, 285 (1910); 18: 161, 190, 211, 249, 275, 293 (1911); 19: 133, 162, 184, 212, 239, 267, 292 (1912); 20: 106, 136, 159, 187, 209, 244, 262 (1913); 21: 32, 49, 80, 105, 134, 161, 190, 208, 215, 222, 232 (1914); 22: 51, 61, 70, 82 (1915); Chem. Umschau 23: 103, 113, 133, 145 (1916); Petrol. Z. 11: 1109, 1174, 1237, 1302 (1916); Petrol. Z. 19: 571, 724, 803, 835, 882, 969, 1001, 1038, 1069, 1110, 1170, 1208, 1243, 1278 (1923). Bibl. footnotes.

SINGER, L. Über Neuerungen auf dem Gebiete der Mineralölanalyse und Mineralölindustrie, sowie Ölschiefer-Untersuchungen und -Verarbeitung in den Jahren 1920-1921. Petroleum Z. 20: 15, 51, 88, 122, 159, 194, 234, 283, 325, 415, 451, 501, 539, 605, 675, 734, 787, 850, 910, 957, 1021, 1083, 1132, 1207, 1265, 1327, 1387, 1435, 1497, 1613, 1708, 1770, 1825, 1898, 1958, 2018 (1924). 3215 footnotes. Bibl., p. 2024-9.

SOCIETY OF CHEMICAL INDUSTRY. Mineral oils. In Annual reports of the progress of applied chemistry, 1: 61-66 (1916); 2: 69-83 (1917); 3: 63-85 (1918); 4: 66-83 (1919); 5: 71-90 (1920); 6: 67-78 (1921); 7: 72-82 (1922); 8: 70-90 (1923); 9: 74-99 (1924). Bibl. footnotes.

STEWART, P. C. A. Petroleum industry of Mexico. J. Inst. Petroleum Tech. 2: 7-37 (1915). 150 references.

SCHWEER, WALTHER. Die türkisch-persischen Erdölvorkommen. Hamburg, Friedrichsen, 1919. 247 p. Bibl., p. 149-169.

WATERS, C. E. Behavior of high boiling mineral oils on heating in the air. U. S. Bur. Standards, Sci. Paper No. 160; Bull. 7: 365-376 (1911). 25 references.

WATERS, C. E. Oxidation of automobile cylinder oils. U. S. Bur. Standards, Tech. Paper No. 73, 1916. 20 p. 26 footnotes.

WILSON, W. J. Petroleum. J. Inst. Petroleum Tech. 8: 690-714 (1922); 9: 179a-202a, 287a-322a (1923).

WISCHN, RUDOLF. Die cyclischen Polymethylene des Erdöls. Chem.-Ztg. 26: 334-335, 354-356 (1902); 37 footnotes. 28: 814-818 (1904); 93 footnotes. 29: 1126-1127 (1905); 27 footnotes.

Serial

Institution of Petroleum Technologists, Journal. Contains a current bibliography since 1919.

Petroleum, Zeitschrift für die gesamten Interessen der Petroleum-Industrie und des Petroleum-Handels. 1905-. Each number contains an abstract section and list and reviews of new books.

See also FUEL OIL, GASOLINE, OIL SHALE, PYROGENESIS.

PETROLEUM: Iodine value.

JOHANSEN, E. M. Iodine and bromine values of petroleum products. J. Ind. Eng. Chem. 14: 288-292 (1922). 30 references.

PETROLEUM: Testing.

ALLEN, IRVING C., and CROSSFIELD, A. S. The flash point of oils: methods and apparatus for its determination. U. S. Bur. Mines, Tech. Paper No. 49, 1914. 38 p. Bibl., p. 31-37. 144 references.

ELLIOTT, ARTHUR H. Report on the methods and apparatus for testing inflammable oils. N. Y. State Board Health, Annual Rept., 1882, p. 38-45.

PETROLEUM: Viscosity.

DEAN, E. W., and LANE, F. W. Viscosity-temperature curves of fractions of typical American crude oils. J. Ind. Eng. Chem. 13: 786 (1921). 36 references.

PHARMACEUTICALS

FOURNEAU, ERNEST. Organic medicaments and their preparation. Philadelphia, Blakiston, 1924.

HARRISON, L. W. The treatment of syphilis. Quart. J. Med. 10: 291-360 (1917). 150 references.

HENIUS, MAX. Die Bedeutung der Farbstoffe in der Medizin. Z. Chemotherap. 2: 1053-1057; 1209-1210 (1913).

MAI, C. Neuerungen in der Darstellung pharmazeutisch-chemiker Präparate. Chem.-Ztg. 28: 99-104 (1904); 29: 153-155 (1905); 30: 169-173 (1906). 225 footnotes.

"Medicines." Ind.-Cat. S. G. O., 1st ser., 9: 48-66 (1888); 2nd ser., 10: 618-628 (1905). Includes patent medicines, adulteration and analysis, physiological action.

MESSNER, J. Vierteljahrsbericht ueber neue Arzneimittel. Z. angew. Chem. 29: 257-261, 319-323, 401-402, 408-409 (1916); 115 footnotes. 30: 49-50, 54-56 (1917); 50 footnotes.

NICKELL, G., and KIPPENBERGER, C. Ueber Neuerungen in der Darstellung chemisch-pharmaceutischer Präparate. Chem.-Ztg. 24: 715-718 (1900); 80 footnotes. 25: 1045-1050 (1901); 114 footnotes. 26: 643-651

- (1902); 221 footnotes. 27: 467-475 (1903); 246 footnotes.
- RABOW, S. Uebersicht der bekannt gewordenen therapeutischen Neuheiten, einschliesslich der Spezialitäten und Geheimmittel. *Chem.-Ztg.* 31: 155-158, 172-173, 203-204, 265-268 (1907); 130 footnotes. 32: 309-311, 330-331, 346, 366-368 (1908); 136 footnotes. 33: 393-395, 418-419, 439-441 (1909); 118 footnotes. 34: 201-203, 209-211 (1910); 81 footnotes. 35: 162-163, 173-175, 190-192 (1911); 127 footnotes. 36: 189-190, 196-197, 206-207, 246-247, 258-260 (1912); 211 footnotes. 37: 413-414, 422-423, 450-451, 466-468, 487-489, 502-503 (1913); 330 footnotes. 38: 305-307, 319, 387-388, 410-411, 427-428, 479-480, 506-507, 540, 547-549 (1914); 431 footnotes. 39: 211-212, 241-242, 254-255, 263-265 (1915); 152 footnotes. 40: 145-147, 167-169, 183-185 (1916); 174 footnotes. 41: 285-286, 298-300, 314-316 (1917); 186 footnotes. 43: 73-75, 87, 99-101 (1919); 137 footnotes. 44: 109-110, 138-140, 146-147 (1920); 162 footnotes. 45: 277-278, 302-303, 325-328 (1921); 239 footnotes.
- ZERNIK, F. Die wichtigsten neuen Arzneimittel des Jahres 1915. *Z. angew. Chem.* 29: 89-92 (1916); 31 footnotes.
- See also ESSENTIAL OILS (Soc. Chem. Ind.)
- PHARMACOGNOSY**
- HANAUSEK, EDUARD. Ueber Neuheiten in der Waarenkunde (Pharmakognosie). *Chem.-Ztg.* 25: 1008-1011 (1901); 28 footnotes. 26: 786-790 (1902); 60 footnotes. 27: 349-352 (1903); 57 footnotes. 28: 82-85 (1904); 41 footnotes. 29: 289-291 (1905); 35 footnotes. 30: 373-375 (1906); 48 footnotes. 31: 299-301 (1907); 39 footnotes. 32: 605-606, 618-619, 647-648 (1908); 64 footnotes. 33: 273-274, 291-292 (1909); 53 footnotes. 34: 157-158, 175-176, 194-196 (1910); 54 footnotes.
- YOUNGKEN, HEBER W. Review of the literature in pharmaceutical botany and pharmacognosy. *J. Am. Pharm. Assoc.* 12: 122-129 (1923); 13: 536-546 (1924). Includes plant chemistry, ash determination, drug adulteration and micro-methods.
- PHARMACOLOGY**
- ABERDEEN UNIVERSITY. Library, Marischal college. Subject catalogue of the Phillips library of pharmacology and therapeutics. Aberdeen Univ. Press, 1911. 240 p. Compiled by Maud S. Best and Helen Pater-son.
- BACHEM, CARL. Sammelreferat aus dem Gebiete der Pharmakologie. *Zentr. innere Med.* 35: 12-13, 242-244, 611-612, 726-727, 1089-1091 (1914); 357 references. 36: 169-170, 349-350, 557-558, 798-799 (1915); 198 references. 37: 144-145, 370-371, 650-652, 827-829 (1916); 229 references. 38: 123-125, 320-321, 569, 779-780 (1917); 179 references. 39: 123-124, 332-333, 523-524, 761-762 (1918); 232 references. 40: 190-191, 371-372, 636-637, 939-941 (1919); 270 references. 41: 243-245, 396-397, 715-716, 844-847 (1920); 311 references. 42: 294-295, 513-514, 755-756, 939-941 (1921); 303 references. 43: 210-212, 404-405, 605-607, 821-822 (1922); 331 references. 44: 197-199, 394-396, 583-586, 760-762 (1923); 481 references.
- CLARK, ALFRED J. *Applied pharmacology*. London, Churchill, 1923. 390 p. Bibl. at end of chapters.
- CUSHNEY, ARTHUR R. A text-book of pharmacology and therapeutics; or, the action of drugs in health and disease. 6th ed. Philadelphia, Lea, 1915. 708 p. Contains bibls.
- DIXON, W. E., and RANSOM, F. Die selektive Wirkung von Arzneien auf das periphere Nervensystem. *Ergeb. Physiol.* 12: 765-768 (1912). 133 references.
- HEFFTER, A. *Handbuch der experimentellen Pharmakologie*. Berlin, Springer. vol. 1, 1923. 1296 p. vol. 2, 2nd half, 1924. 1974 p. Bibl. footnotes.
- HIRSCHFELDER, ARTHUR D. Influence of modern chemistry on pharmacology. *Ind. Eng. Chem.* 15: 455-460, 524 (1923). 60 references.
- "Pharmacology." *Ind.-Cat. S. G. O.*, 1st ser., 11: 4-7 (1890); 2nd ser., 13: 167-174 (1908).
- SALANT, WM. The pharmacology of heavy metals. *J. Ind. Hyg.* 2: 72-78 (1920). 25 references.
- SEIFERT, OTTO. Die Nebenwirkungen der modernen Arzneimittel. Würzburg, Kabitzsch, 1915. 283 p. Contains bibls.
- SOLLMANN, TAROLD H. A manual of pharmacology and its application to therapeutics and toxicology. 2nd ed. Philadelphia, Saunders, 1922. 1066 p. Bibl., p. 965-1043.
- SOLLMANN, T. The pharmacology of the autonomic system. *Physiol. Rev.* 2: 479-504 (1922). 80 references.
- TIGERSTEDT, ROBERT. Die chemischen Bedingungen für die Entstehung des Herzschlages. *Ergeb. Physiol.* 12: 269-274 (1912). 145 references.

PHARMACOLOGY—Cont'd*Serial*

Bulletin des sciences pharmacologiques. 1898-. Each number contains an abstract section.

PHARMACOPOEIAS

"Pharmacopoeias." Ind.-Cat. S. G. O., 1st ser., 11: 7-17 (1890); 2nd ser., 13: 175-190 (1908).

PHARMACY

ARNY, HENRY V. Principles of pharmacy. 2nd ed. Philadelphia, Saunders, 1917. 1056 p. Bibl. at end of each chapter.

BUCHTING, A. Bibliotheca pharmaceutica, oder Verzeichniss aller auf dem Gebiete der Pharmacie in den letzten 20 Jahren, 1849-1868, im deutschen Buchhandel erschienenen Bücher und Zeitschriften. Ein bibliographisches Handbüchlein für Pharmaceutisch-Medicinalbehörden und Buchhändler. Nordhausen, 1869.

DORVEAUX, PAUL M. J. Catalogue des thèses de pharmacie soutenues en province depuis le création des écoles de pharmacie jusqu'à nos jours (1803-1894); suivi d'un appendice au "Catalogue" des thèses soutenues devant l'École de pharmacie de Paris. Paris, Welter, 1894. 117 p.

DU MEZ, ANDREW G. Digests of comments on the pharmacopoeia of the United States of America and on the national formulary for the calendar year ending December 31, —. U. S. Hyg. Lab. Bull. No. 118 (1915); 455 p. 119 (1916); 316 p. 125 (1917); 340 p. 127 (1918); 356 p. 129 (1919); 378 p. 131 (1920); 410 p. 137 (1921); 283 p.

FÉDÉRATION INTERNATIONALE PHARMACEUTIQUE. Liste des journaux et revues pharmaceutiques du monde entier. La Haye, 1910. 39 p.

FLURY, FERDINAND. Jahresbericht ueber die Fortschritte der pharmazeutischen Chemie. Z. angew. Chem. 19: 321-327, 377-385 (1906); 56 footnotes. 20: 613-623, 646-653 (1907); 49 footnotes. 21: 821-832, 867-880 (1908); 69 footnotes. 22: 778-784, 818-827, 872-878, 921-929 (1909); 132 footnotes. 23: 1060-1069, 1108-1115, 1159-1165 (1910); 104 footnotes. 24: 322-333 (1911); 145 footnotes. 25: 1045-1054 (1912); 113 footnotes. 27: 410-422 (1914); 177 footnotes.

HAMILTON, HERBERT C. Pharmaceutical assaying. J. Am. Pharm. Assoc. 8: 49-64 (1919). 78 references.

HÜBNER, O. Pharmaceutische Chemie. Fortschritte Chem. 4: 147-154

(1911); 5: 371-380 (1912); 7: 127-135 (1913). References through text.

LÜDERS, R. Bericht ueber die Arbeiten in der chemischen-pharmazeutischen Industrie und pharmazeutischen Chemie, 1908-1909. Chem.-Ztg. 33: 909-911, 918-920 (1909); 77 footnotes. 34: 633-634, 642-643, 659-660, 675-676, 682-684 (1910); 124 footnotes.

MANNICH, C. Pharmaceutische Chemie. Fortschritte Chem. 1: 199-206 (1909); 2: 299-305 (1910). References through text.

NEDERLANDSCHE MAATSCHAPPIJ TER BEVORDERING DER PHARMACIE. Bibliotheek. Catalogus van de Algemeene pharmaceutische bibliotheek en van de boeken over pharmacie en aanverwante vakken, aanwezig in de Universiteitsbibliotheek van Amsterdam. Uitgegeven door de Nederlandsche maatschappij ter bevordering der pharmacie. Amsterdam, Centen, 1911. 261 p. "A classified catalogue with alphabetical author and subject indexes," by T. P. Sevensma.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN. Library. Catalogue of the library of the Pharmaceutical society of Great Britain, in London. 10th ed. Compiled by John Wm. Knapman, librarian. Also catalogue of the library of the society in Edinburgh. London, 1911. 560 p.

Pharmaceutical syllabus. 2nd ed., outlining a minimum course of instruction of twelve hundred hours. Albany, N. Y., Williams, 1913. 220 p. Bibl., p. 159-192, 195-211.

"Pharmacy." Ind.-Cat. S. G. O., 1st ser., 11: 17-64 (1890); 2nd ser., 13: 190-218 (1908).

PLOHN, R. Pharmazeutische Chemie. Fortschritte Chem. 10: 215-223 (1914-1915). References through text.

STRASSBURG. Universität. Pharmazeutisches Institut. Bibliothek. Katalog der Flückiger-Bibliothek im pharmazeutischen Institute der Universität Strassburg. Strassburg, 1904. 159 p.

WILBERT, M. I. Digests of comments on the pharmacopoeia of the United States of America and on the national formulary. U. S. Hyg. Lab., Bull. No. 49 (1905), 293 p. 58 (1906), 523 p. 63 (1907), 464 p. 75 (1908), 564 p. 79 (1909), 735 p. 84 (1910), 784 p. 87 (1911), 683 p. 93 (1912), 495 p. 98 (1913), 518 p. 105 (1914), 516 p. Continued by Du Mez.

Serial

AMERICAN PHARMACEUTICAL ASSOCIATION. Proceedings, 1852-1911 (59 vols.). Yearbook, 1912 to date. Contains abstracts of all important work on pharmacy.

Berlinisches Jahrbuch für Pharmazie und für die damit verbundenen Wissenschaften. 1795-1838.

BRAITHWAITE, J. O., Editor. Yearbook of pharmacy, comprising abstracts of papers relating to pharmacy, materia medica and chemistry contributed to British and foreign journals from July 1, —, to July 1, —, etc. London, Churchill. Issued annually.

Jahresbericht über die Fortschritte der Pharmacie, Pharmacognosie und Toxikologie. 1841- .

Journal of the American Pharmaceutical Association. 1921-. "Bibliography of pharmaceutical research," conducted by H. V. Arny. Includes: Pharmacopoeial revision; pharmaceutical preparations; general botany and bacteriology; therapeutics and new remedies; vegetable and animal materia medica; general and physical chemistry; inorganic chemicals; organic chemicals; clinical and diagnostic methods.

PHASE RULE

FINDLAY, ALEX. The phase rule and its applications. 5th ed. New York, Longmans, 1923. 298 p. Bibl. footnotes.

PHELLANDRENE

BARTELT, K. Phellandren. *In* Abderhalden, Biochem. Handl. 7: 295-300 (1912); 80 footnotes.

PHENACETIN

"Phenacetin." Ind.-Cat. S. G. O., 1st ser., 11: 75 (1890); 2nd ser., 13: 235-236 (1908).

PHENANTHRENE

BAUM, FRITZ. Phenanthren. *In* Abderhalden, Biochem. Handl. 1: 353-358 (1911). 50 references.

KUNZ, MAX A. Untersuchungen ueber Phenanthren. Berlin, Springer, 1901. 99 p. References are given to tables of derivatives.

SANDQUIST, HAKAN. [Tabular review of the literature on phenanthrene derivatives for the years 1902-1912, inclusive.] Arb. Utgifta Med. Understöd of Vilhelm Ekmans Universitetsfond, Uppsala, No. 14. 106 p.

SANDQUIST, H. Studien ueber die Phenanthrensulfosäuren. Arkiv

Kem. Mineral. Geol. 4, No. 33. 1912. 118 p. Bibl. footnotes.

PHENAZINE GROUP

MEYER-JACOBSON. Die Phenazin-Gruppe. *In their* Lehrb. org. Chem. 2, pt. 3: 1388-1421 (1920). Bibl. footnotes.

PHENOCOLL

"Phenocoll." Ind.-Cat. S. G. O., 2nd ser., 13: 237-238 (1908).

PHENOLS

"Carbolic acid." Ind.-Cat. S. G. O., 1st ser., 1: 75-78 (1880); 2nd ser., 1: 103-109 (1896); 3rd ser., 1: 110-113 (1918). Includes toxicology.

EINBECK, H. Phenol. *In* Abderhalden, Biochem. Handl. 1: 530-560 (1911). About 600 references. Includes derivatives.

GIBBS, H. D. The compounds which cause the red color in phenol. Philipp. J. Sci. 3: 361-370 (1908). 33 footnotes.

GIBBS, H. D. The action of sunlight upon phenolic compounds and amines. J. Am. Chem. Soc. 34: 1190-1207 (1912). Bibl. footnotes.

MEYER-JACOBSON. Die einwertige Phenole. *In their* Lehrb. org. Chem. 2, pt. 1: 359-407 (1896). Bibl. footnotes.

"Phenols." Ind.-Cat. S. G. O., 1st ser., 11: 76 (1890); 2nd ser., 13: 237-238 (1908).

PHENOLS: Analytical.

FOX, J. J., and BARKER, M. F. The estimation of phenol in cresylic acid. J. Soc. Chem. Ind. 37: 268T (1918). 30 references.

LLOYD, S. J. Determination of phenols. J. Am. Chem. Soc. 27: 16-24 (1905). 30 references.

TISDALL, FREDERICK F. Estimation of phenolic substances in urine. J. Biol. Chem. 44: 409 (1920). 48 references.

PHENOLS: Physiology.

DUBIN, HARRY. Physiology of the phenols. J. Biol. Chem. 26: 69 (1916). 16 references.

PELKAN, K. F., and WHIPPLE, G. H. Physiology of the phenols. Metabolism. J. Biol. Chem. 50: 499-511 (1922). 24 references.

PHENOLCARBOXYLIC ACIDS

ANSCHÜTZ, RICHARD. Ueber die Einwirkung von Phosphorpentachlorid und Phosphortrichlorid auf substituierte *o*-Phenolcarbonsäure. Ann. 346: 286-381 (1906). 80 footnotes.

MEYER-JACOBSON. Phenolcarbonsäuren. *In their* Lehrb. org. Chem. 2, pt. 1: 622-686 (1902). Bibl. footnotes.

PHENOLPHTHALEIN

MARGOSCHES, B. M. Betrachtungen ueber die Konstitution der Alkalisalze des Phenolphthaleins. *Z. angew. Chem.* 20: 181-191, 226-231 (1907). 128 footnotes.

See also DYES, INDICATORS.

PHENYLACETIC ACID

MEYER-JACOBSON. Phenylelessigsäure. *In their Lehrb. org. Chem.* 2, pt. 1: 596-598 (1902).

See also ACIDS, ORGANIC.

PHENYLALANINE

WINTERSTEIN, E., and TRIER, G. Phenylalanin. *In Abderhalden, Biochem. Handl.* 4: 668-676 (1911); 9: 131-132 (1915). About 160 footnotes.

See also AMINO ACIDS.

PHENYL ETHER

COOK, ALFRED N. Phenyl ether and some of its derivatives. *J. Am. Chem. Soc.* 32: 1285-1294 (1910). 38 footnotes.

JONES, H. I., and COOK, A. N. Mononitro phenyl ethers. *J. Am. Chem. Soc.* 38: 1547-1550 (1916). 56 references. Chronological.

PHENYL SALICYLATE

"Salol." *Ind.-Cat. S. G. O.*, 1st ser., 12: 489-490 (1891); 2nd ser., 15: 59 (1910).

PHENYLENEDIAMINES

MEYER-JACOBSON. Zweiwertige Amine. *In their Lehrb. org. Chem.* 2, pt. 1: 228-234 (1895). Bibl. footnotes.

PHENYLHYDRAZINE

MEYER-JACOBSON. Hydrazine. *In their Lehrb. org. Chem.* 2, pt. 1: 303-320 (1895). Bibl. footnotes.

"Phenylhydrazine." *Ind.-Cat. S. G. O.*, 2nd ser., 13: 239 (1908).

PHLOGISTON. See ALCHEMY.**PHLORGLUCINOL**

EINBECK, H. Phloroglucin. *In Abderhalden, Biochem. Handl.* 1: 674-681 (1911). 150 footnotes. Includes derivatives.

MEYER-JACOBSON. Phloroglucin. *In their Lehrb. org. Chem.* 2, pt. 1: 425-427 (1896). Bibl. footnotes.

PHLORHIDZIN

"Phlorhidzin." *Ind.-Cat. S. G. O.*, 1st ser., 11: 108 (1890); 2nd ser., 13: 255-256 (1908).

ZEMPLÉN, G. Phlorrhizin. *In Abderhalden, Biochem. Handl.* 10: 845-848 (1923). Bibl. footnotes.

See also GLYCOSURIA (Lusk).

PHORONE

MEYER-JACOBSON. Phoron. *In their Lehrb. org. Chem.* 1, pt. 1: 1028 (1907). 25 references.

PHOSGENE

BEROLZHEIMER, D. D. Bibliography of carbonyl chloride (phosgene) and

its derivatives. *J. Ind. Eng. Chem.* 11: 263-266 (1919). 255 references.

GERMANN, ALBERT F. O. Reactions in phosgene solutions. *J. Phys. Chem.* 28: 879-886 (1924). Bibl. footnotes.

MELLOR, J. W. Carbonyl chloride. *In his Inorg. theor. chem.* 5: 962-971 (1924).

MEYER-JACOBSON. Carbonylchlorid. *In their Lehrb. org. Chem.* 1, pt. 2: 1348-1351 (1913). Bibl. footnotes.

PHOSPHATES

CAMERON, F. K., and JURST, L. A. Action of water and saline solutions upon certain slightly soluble phosphates. *J. Am. Chem. Soc.* 26: 885-913 (1904). Bibl. footnotes.

GREAVES, J. E. Effects of soluble salts in insoluble phosphates. *J. Biol. Chem.* 7: 287-319 (1910). 59 references.

GR. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Phosphates. (1913-1919.) London, 1921. 72 p. Bibl., p. 67-72.

KNORRE, G. v. Beiträge zur Kenntniss der Metaphosphate. *Z. anorg. Chem.* 24: 369-401 (1900). 40 footnotes.

MANSFIELD, G. R. The phosphate resources of the United States. Pan-Am. Sci. Congr., Washington, Proc. 2nd sec., 7: 764-766 (1917). 57 references.

MANSFIELD, G. R. Phosphate rock in 1922. *U. S. Geol. Sur., Mineral Resources*, 1922, pt. 2: 128-132.

MATSON, G. C. The phosphate deposits of Florida. *U. S. Geol. Sur., Bull. No. 604*, 1915. 101 p. Bibl., p. 95-98. 83 references.

PHALEN, W. C. The conservation of phosphate rock in the United States. Pan-Am. Sci. Congr., Washington, Proc. 2nd sec., 7: 806-808 (1917). 76 references.

PHALEN, W. C. Report on the phosphate rocks of central Kentucky. *Kentucky Geol. Sur., Bull.*, 1915. 80 p. Bibl., p. 78-80. 85 references.

SCHUCHT, L. Die Fabrikation des Superphosphats. 3rd ed. Brunswick, 1909. 460 p.

U. S. Dept. of Agriculture. Fertilizer resources of the United States. 62nd Congr., 2nd Sess., Senate Doc. No. 190. 290 p. Bibl. on phosphates, p. 78-106.

U. S. Geological Survey. Survey publications relating to phosphates. *U. S. Geol. Sur., Mineral Resources*, 1913, pt. 2: 288-289 (1914); 1914, pt. 2: 55-56 (1915). 41 references.

WAGGAMAN, W. H. Phosphate rock. *Mineral Ind.* 25: 568-585 (1916); 26: 517-532 (1917); 27: 553-568 (1918); 28: 534-548 (1919); 29: 531-545 (1920); 30: 536-553 (1921); 31: 553-568 (1922). About 150 references.

WAGGAMAN, W. H., and FRY, W. H. Phosphate rock and methods proposed for its utilization as a fertilizer. U. S. Dept. Agr., Bull. No. 312, 1915. List of patents.

See also FERTILIZERS.

PHOSPHATIDES. See LIPOIDS.

PHOSPHINE

GUTBIER, A. Phosphor und Wasserstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 52-76 (1911). References through text.

PHOSPHOMOLYBDIC ACID

KIESER, A. J. Molybdän und Phosphor. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 953-963 (1912). References through text.

PHOSPHORESCENCE

KAYSER, H. G. J. Phosphoreszenz. *In* his *Handb. der Spectroscopie* 4: 599-838 (1908). Bibl. footnotes.

"Phosphorescence." *Ind.-Cat. S. G. O.*, 1st ser., 11: 110 (1890); 2nd ser., 13: 262 (1908).

WAENTIG, PERCY. Zum Chemismus phosphoreszierender Erdalkalisulfide. *Z. physik. Chem.* 51: 435-472 (1905). 50 footnotes.

See also BIOLUMINESCENCE, LUMINESCENCE.

PHOSPHORIC ACID

GUTBIER, A. Phosphor und Sauerstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 76-204 (1911).

"Phosphoric acid." *Ind.-Cat. S. G. O.*, 1st ser., 1: 88 (1880); 2nd ser., 1: 117 (1896); 3rd ser., 1: 123-124 (1918).

See also PHOSPHORUS (Schenck).

PHOSPHORIC ACID: Analytical.

GUTBIER, A. Nachweis, Bestimmung und Trennung der H_3PO_4 und der Orthophosphate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 162-173, 849-850 (1911). Classified by methods.

JODIDI, S. L., and KELLOGG, E. H. On the factor to be used for the calculation of the phosphoric acid in Neumann's method. *J. Franklin Inst.* 180: 349-367 (1915). 30 footnotes.

JÖRGENSEN, G. [On the determination of phosphoric acid as magnesium-ammonium phosphate and as ammonium molybdate.] *K. Danske Vidensk. Selsk. Skr.* (7) 2: 141-238 (1905). 269 references.

PHOSPHORITE

SAMOJLOFF, J. Phosphorite. *In* Doelter, *Handb. Mineralchem.* 3, pt. 1: 352-364 (1918). Bibl. footnotes.

PHOSPHOROUS ACID

GUTBIER, A. Phosphorige Säure. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 111-119 (1911). References through text.

PHOSPHORUS

GIRAN, H. Phosphore. *In* Moissan, *Chim. min.* 1: 691-802 (1904). 814 footnotes.

GUTBIER, A. Phosphor. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 1-52 (1911). References through text.

LEMOINE, GEORGE. Phosphore et ses composés. *In* Frémy, *Enc. chim.* 2, 2^e cahier: p. 242-508 (1885). References through text.

"Phosphorus." *Ind.-Cat. S. G. O.*, 1st ser., 11: 110-120 (1890); 2nd ser., 13: 263-270 (1908).

SCHENCK, —. Phosphor. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 3: 482-489 (1907). Classified by compounds.

WAESER, B., and d'ANS, J. Phosphor und seine Verbindungen. *In* Bräuer and d'Ans, *Fortschritte* 1: 2147-2148 (1922). 31 German patents.

PHOSPHORUS: Analytical.

ARTMANN, P. Phosphorbestimmung in Eisen und Stahl. *Z. angew. Chem.* 26: 203-208 (1913). 60 footnotes.

GUTBIER, A. Nachweis und Bestimmung des Phosphors. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 3: 49-52, 831-832 (1911).

HIBBERD, P. L. A study of the Pemberton-Kilgore method for the determination of phosphoric acid. *J. Ind. Eng. Chem.* 5: 1008-1009 (1913).

LUNDELL, G. E. F., and HOFFMAN, J. I. Notes on the determination of phosphorus. *Ind. Eng. Chem.* 15: 44-47 (1923). 16 references.

WORSHAM, WM. A. A study of the stability of magnesium ammonium phosphate ($MgNH_4PO_4 \cdot 6H_2O$) and a method of determining phosphorus as magnesium ammonium phosphate. Thesis, Columbia Univ., 1924. 35 p. Bibl., p. 33-34.

PHOSPHORUS: Organic compounds.

ANDERSON, RUDOLPH J. The occurrence of organic phosphorus compounds in plants. Thesis, Cornell Univ., 1919. 70 p. Bibl., p. 64-70. Originally published in *J. Biol. Chem.* as a series.

MICHAELIS, A. Ueber die organischen Verbindungen des Phosphors mit

PHOSPHORUS: Organic compounds—
Cont'd

dem Stickstoff. *Ann.* 326: 129-258 (1903). 125 footnotes.

MEYER-JACOBSON. Verbindungen des Phosphors. *In their Lehrb. org. Chem.* 1, pt. 1: 423-432 (1907); 2, pt. 1: 352-354 (1896).

SJOLLEMA, B. Die biochemisch belangrijke organische phosphorzuurverbindingen. *Chem. Weekblad* 12: 128-148, 282-302 (1915). *Bibl. footnotes.*

PHOSPHORUS: Pharmaceutical.

BOYD, L. J. Phosphorus. *Hahnemannian Mo.* 59: 129-138 (1924). 62 references.

PHOSPHORUS BROMIDES

GUTBIER, A. Phosphor und Jod. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 352-359 (1911).

PHOSPHORUS CHLORIDES

GUTBIER, A. Phosphor und Chlor. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 303-322 (1911).

PHOSPHORUS FLUORIDES

GUTBIER, A. Phosphor und Fluor. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 291-303 (1911).

PHOSPHORUS IODIDES

GUTBIER, A. Phosphor und Jod. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 373-383 (1911).

PHOSPHORUS OXIDES

GUTBIER, A. Phosphor und Sauerstoff. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 76-103 (1911).

PHOSPHORUS OXYCHLORIDE

GUTBIER, A. Phosphor, Chlor und Sauerstoff. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 325-335 (1911).

PHOSPHORUS SULFIDES

GUTBIER, A. Phosphor und Schwefel. *In Gmelin-Kraut, Handb. anorg. Chem.* 1, pt. 3: 244-270 (1911).

PHOSPHOTUNGSTIC ACID

KIESER, A. J. Phosphorwolframsäuren. *In Gmelin-Kraut, Handb. anorg. Chem.* 3, pt. 1: 768-780 (1912).

PHOTOCHEMISTRY

ANDERSON, WM. T., JR., and TAYLOR, HUGH S. The inhibition of the photochemical decomposition of hydrogen peroxide solutions. *J. Am. Chem. Soc.* 45: 650-662 (1923). 76 footnotes.

BAUDISCH, O., and MAYER, E. Photochemical studies on the assimilation of nitrates and nitrites. *Z. physiol. Chem.* 89: 175-227 (1914).

BLASCHKE, M. Photochemie. *Fortschritte Chem.* 11: 147-169 (1915-1916); 13: 49-57 (1917-1918); 14: 55-93 (1918-1919); 15: 89-98 (1919-1920). References through text.

BOLIN, IWAN. Ueber die photochemische Zersetzung von Milchsäure in Gegenwart von Uranylsulfat. *Z. physik. Chem.* 87: 490-506 (1914). *Bibl. footnotes.*

BYK, A. Photochemie. *Fortschritte Chem.* 1: 14-24 (1909); 2: 11-19 (1910); 3: 339-350 (1910-1911); 6: 17-32 (1912-1913). References through text.

COEHN, ALFRED. Photochemische Vorgänge in Gase. *Jahrb. Radioakt. Elektronik* 7: 577-639 (1910). *Bibl. footnotes.*

CUSTIS, HORACE H. Studies in actinocchemistry. *J. Franklin Inst.* 184: 617-636, 849-884 (1917). 249 footnotes.

EDER, JOSEPH M. Geschichte der Photochemie und Photographie von Alterthume bis in die Gegenwart. Halle, 1891. 147 p.

EDER, JOSEPH M. Photochemie, die chemische Wirkung des Lichtes. Halle, Knapp, 1906. 533 p. *Bibl. footnotes.*

EDER, J. M. Ueber Sensibilisatoren bei photochemischen, photographischen und biologischen Prozessen. *Jahrb. Radioakt. Elektronik* 19: 73-92 (1922). *Bibl. footnotes.*

GEBHARDT, K. Photochemie. *Fortschritte Chem.* 9: 27-47 (1914).

GIBBS, H. D. The action of sunlight upon methyl alcohol. *Philipp J. Sci.* 7: 57-74 (1912). 56 footnotes.

HANSEN, CHRISTIAN J. Bericht ueber die Fortschritte der Photochemie im Jahre 1911. *Z. angew. Chem.* 25: 1671-1678, 1715-1722 (1912). 123 footnotes.

HEISE, GEORGE W., and MATHEWS, J. H. A review of the progress in photochemistry since the last international congress. *In* 8th Intern. Congr. Appl. Chem., 20: 181-187 (1912). *Bibl. footnotes.*

HOUBEN, J. Belichten. *In his Methoden der organischen Chemie* 2: 912-1043 (1922). *Bibl. footnotes.*

MELLOR, J. W. Action of light on silver halides. *In his Inorg. theor. chem.* 3: 408-418 (1923). 200 references.

PLOTNIKOV, IVAN S. Allgemeine Photochemie, ein Hand- und Lehrbuch für Forschung, Praxis und Studium. Berlin, Gruyter, 1920. 729 p. *Bibl. through text.*

PLOTNIKOV, I. Photochemische Versuchstechnik. Leipzig, 1912. *Bibl. at end of chapters.*

SCHAUM, KARL. Photochemie und Photographie. Leipzig, Barth, 1908. 228 p. *Bibl. footnotes.*

- SHEPPARD, S. E. Photochemistry. London, Longmans, 1914. 446 p. Bibl. footnotes.
- TAYLOR, HUGH S. Photochemistry. In *his* Treatise on physical chemistry, 2: 1205-1251 (1924). Bibl. footnotes.
- TRIVELLI, A. P. H. Neuere Theorie der photochemischen Vorgänge in der Bromsilbergelatine Platte. *Jahrb. Radioakt. Elektronik* 8: 334-383 (1911). Bibl. footnotes.
- TUCKERMAN, ALFRED. Bibliography of the chemical influence of light. *Smithsonian Misc. Coll.*, No. 785. 1891. 22 p.
- VALENTA, E. Fortschritte auf dem Gebiete der Photochemie und Photographie. *Chem.-Ztg.* 29: 634-637 (1905); 107 footnotes. 30: 1007-1009 (1906); 100 footnotes. 31: 867-869 (1907); 98 footnotes. 32: 1089-1090, 1102-1104 (1908); 77 footnotes. 33: 933-935, 942-943 (1909); 105 footnotes. 34: 713-714, 722-723 (1910); 114 footnotes. 35: 941-943, 962-963 (1911); 97 footnotes. 36: 1337-1340 (1912); 113 footnotes. 45: 709, 733, 777, 801, 805, 830, 854 (1921); 347 footnotes.
- WEIGERT, FRITZ. Die chemische Wirkung des Lichtes. *Sammlung chem. chem.-tech. Vorträge* 17: 183-296 (1911). Bibl. footnotes.
- WINTHER, CHR. Die theoretische Photochemie, 1909-1913. *Z. wiss. Phot.* 14: 30-32. 141 references.
- See also ELECTRONICS, PHOTOSYNTHESIS.
- ## PHOTOGRAPHY
- BANCROFT, WILDER D. Photographic plate, the latent image. *J. Phys. Chem.* 15: 313-366, 551-579 (1911); 16: 29-68, 89-125 (1912); 17: 93-153 (1913). 200 footnotes.
- BLASCHKE, M. Photographie. *Fortschritte Chem.* 14: 43-54 (1918-1919); 15: 121-130 (1919-1920).
- Bücher und Zeitschriften auf dem Gebiete der Photographie und Reproduktionstechnik. Halle, Knapp, n. d. 32 p. Classified.
- BUGUET, ABEL, and GIOPPI, L. La bibliothèque du photographie en français, italien, anglais, allemand, espagnol. Paris, 1892. 84 p.
- COVENTRY PUBLIC LIBRARY. Photography. In *its* Readers' Bull. 2: 63-72 (May, 1924).
- FERGUSON, W. B., ed. A memorial volume containing an account of the photographic researches of Ferdinand Hunter and Vero C. Driffield; being a reprint of their published papers together with a history of their early work and a bibliography of later work on the same subject. London, Royal Photographic Soc., 1920. 374 p. Bibl., p. 342-366.
- GAMBLE, WM. B. Color photography. A list of references in the New York Public Library. *Bull. N. Y. Pub. Library* 28: 475-498, 557-577 (1924). Chronological, 1761-1923. 2355 titles of books and periodical articles.
- GR. BRIT. Patent office library. Subject list of photomechanical printing and photography in the Library of the Patent Office. London, 1914. 121 p. Includes photographic chemistry, color photography, etc.
- HALEN, S. Die chemische Herstellung und Behandlung von Filmen. *Kunststoffe* 12: 73-76 (1922). Patents through text.
- LEHMAN, E. Photographie. *Fortschritte Chem.* 5: 299-305 (1912); 7: 235-243 (1913); 10: 1-11 (1914-1915). References through text.
- LÜPPO-CRAMER. Photographie. *Fortschritte Chem.* 1: 25-27, 251-254 (1909). References through text.
- LÜPPO-CRAMER, —. Ueber die kolloidchemischen Verhältnisse in den Kolloidumschichten. *Kolloid-Z.* 12: 309-317; 13: 35-41 (1913). 79 footnotes.
- LÜPPO-CRAMER, and LIESEGANG, R. Ed. Zur Kolloidchemie der photographischen Bildentwicklung. *Kolloid-Z.* 9: 290-296 (1911). 32 footnotes.
- MATHEWS, J. H., and HEISE, G. W. Review of the progress in the theory of photography since the last international congress (1909-1912). In 8th Intern. Congr. Appl. Chem. 20: 259-265 (1912). 45 footnotes.
- MEES, C. E. K. Recent advances in photographic theory. *J. Franklin Inst.* 195: 1-21 (1923). 26 footnotes.
- MÜHLESTEIN, EMILE. Problèmes fondamentaux de la plaque photographique. *Arch. sci. phys. nat.* (5) 5: 110-128 (1923). 190 references.
- NIETZ, A. H. The theory of development. New York, Van Nostrand, 1922. 190 p. Bibl., p. 179-185.
- NIETZ, A. H., and HUSE, K. The sensitometry of photographic intensification. *J. Franklin Inst.* 185: 408 (1918). 20 references.
- "Photography." *Ind.-Cat. S. G. O.*, 1st ser., 11: 121 (1890); 2nd ser., 13: 272-273 (1908).
- REINDEERS, W. Studien ueber die Photohaloide. II. Die Konstitution der Photohaloide. *Z. physik. Chem.* 77: 356-366 (1911). Bibl. footnotes.
- RENWICK, F. F. Photographic images, visible and invisible. *J. Soc. Chem. Ind.* 39: 162-163T (1920). 100 references.

PHOTOGRAPHY—*Cont'd*

- SCHAUM, KARL. Fortschritte auf dem Gebiete der wissenschaftlichen Photographie. Chem. Z. 3: 268-271, 567-570 (1904); 86 footnotes. 4: 131-133 (1905); 92 footnotes.
- SCHLOEMANN, E. Fortschritte der wissenschaftlichen Photographie. Z. wiss. Phot. 15: 55-64, 78-96 (1916); 17: 169-192, 218-240, 241-250 (1918). Bibl. through text.
- SHEPPARD, S. E. Gelatin in photography. New York, Van Nostrand, 1923. 263 p. Bibl., p. 229-245. Index of authors.
- SHEPPARD, S. E. The dispersity of the silver halides in relation to their photographic properties. In Colloid symposium Mon., Univ. Wisconsin, 1923, p. 346-366. 42 footnotes.
- SHEPPARD, S. E. Recent contributions of chemistry to photography. J. Ind. Eng. Chem. 14: 820-823 (1922). 86 references.
- SLADE, R. E. Colloid chemistry in photography. In Third report on colloid chemistry, 1920, p. 77-80; Brit. J. Phot. 67: 645-647 (1920).
- SNODGRASS, LLOYD L. The science and practice of photographic printing. Effingham, Ill., 1923. 304 p. Bibl., p. 293-296.
- SOCIETY OF CHEMICAL INDUSTRY. Photographic materials and processes. In Reports of the progress of applied chemistry 1: 298-315 (1916); 2: 495-509 (1917); 3: 457-466 (1918); 4: 508-522 (1919); 5: 505-522 (1920); 6: 539-564 (1921); 7: 510-530 (1922); 9: 576-616 (1924). Bibl. footnotes. Reprinted in the Brit. J. Phot.
- STENGER, E. Photographie. Fortschritte Chem. 2: 157-168 (1910); 3: 213-220 (1910-1911). References through text.
- TRIVELLI, A. P. H., and SHEPPARD, S. E. The silver bromide grain of photographic emulsions. New York, Van Nostrand, 1922. 143 p.
- WALL, E. J. Practical color photography. Am. Photographic Pub. Co., 1922.
- WORDEN, E. C. Collodion in the photographic art, color photography, etc. In his Technology of cellulose esters 1: 2795-2921 (1921). Many hundred references and patents.
- ZUCHOLD, ERNST A. Bibliotheca photographica. Verzeichniss der auf dem Gebiete der Photographie, sowie der damit verwandten Künste und Wissenschaften seit Erfindung der Daguerreotypie bis zu Anfang des Jahres 1860 erschienenen Schriften. Leipzig, 1860.

Serial

- Jahrbuch für Photographie und Reproduktionstechnik. 1887-
- Monthly abstract bulletin. (Eastman Kodak Co.) 1915- Covers photography, physics, chemistry, technology, books, patents.
- Photographic abstracts. 1921- Covers color photography, cinematography, manufacture of photographic materials, photographic optics, photomechanical processes, radiography, applications of photography, sensitometry, actinometry, photometry, theory of photography, photographic processes. Includes patents.
- Photographisches Centralblatt. 1895-1904. Continued as Photographische Rundschau und photographisches Centralblatt, 1905-1911. Continued as Photographisches Rundschau und Mitteilungen, 1912-

PHOTOMETRY

- POWELL, A. L., and SUMMERS, J. A. Commercial photometry. Gen. Elec. Rev. 24: 57 (1921).
- WALSH, JOHN W. T. The elementary principles of lighting and photometry. London, Methuen, 1923. Bibl., p. 196-211.

PHOTOSYNTHESIS

- BENECKE, W., and JOST, L. Pflanzenphysiologie. I. Stoffwechsel. Jena, Fischer, 1924. 441 p. Chapters on the assimilation of carbon, nitrogen, etc. Bibl. footnotes.
- BROWN, W. H., and HEISE, G. W. The application of photochemical temperature coefficients to the velocity of carbon dioxide assimilation. Philipp. J. Sci. 12C: 1-26 (1917). 31 footnotes.
- BROWN, W. H., and HEISE, G. W. The relation between light intensity and carbon dioxide assimilation. Philipp. J. Sci. 12C: 85-98 (1917). 23 references.
- BRUNNER, KARL. Ueber den chemischen Prozess der Synthese durch die Aufnahme der Kohlensäure. Ann. 351: 313-331 (1907). 55 footnotes.
- CZAFEK, F. Die photochemische Zuckersynthese in der Pflanzen. In his Biochemie der Pflanzen, 3rd ed., 1: 506-629 (1922). Bibl. footnotes.
- GUTBIER, A. Assimilation (of CO₂). In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 673-676 (1911). References through text.
- JORGENSEN, INGVAR, and STILES, WALTER. Carbon assimilation. London, Wesley, 1917. 180 p. Reprinted from New Phytologist. Bibl. footnotes.

- KIMPFILIN, G. Essai sur l'assimilation photochlorophyllienne du carbone. Thesis, Lyon, 1908. 150 p. 500 references.
- KNUDSON, L. Influence of certain carbohydrates on green plants. New York, Cornell Agr. Expt. Sta., Mem. 9: 5-75 (1916). Bibl., p. 71-75.
- LUBIMENKO, W. N. [The relation between chlorophyll and photosynthetic energy.] Trav. Soc. Imp. Nat. St. Petersburg, 41, No. 3 (1910). 366 p.
- MANGHAM, S. The translocation of carbohydrates in plants. Sci. Progress 5: 256-285, 457-479 (1910).
- OTTENWALDER, A. Lichtintensität und Substrat bei der Lichtkeimung. Z. Bot. 6: 785-848 (1914).
- SCHMIDT, A. Die Abhängigkeit der Chlorophyllbildung von der Wellenlänge des Lichtes. Beitr. Biol. Pflanz. 12: 269-294 (1914).
- SCHÖNFELD, E. Ueber den Einfluss des Lichtes auf etiolierte Blätter. Beitr. Biol. Pflanz. 12: 351-412 (1914).
- SPOEHR, H. A., and McGEE, J. M. Studies in plant respiration and photosynthesis. Carnegie Inst. Washington, Pub. No. 325, 1923. 98 p. Bibl. footnotes.
- STOKLASA, J. [Significance of the action of ultraviolet rays on the photochemical synthesis of carbohydrates in cells containing chlorophyll.] Strahlentherapie 6: 119-172 (1915). "General survey of literature."
- WOKER, GERTRUD. Zum Assimilationsproblem. Arch. ges. Physiol. 176: 11-38 (1919). Bibl. footnotes.
- ZON, RAPHAEL, and GRAVES, HENRY S. Light in relation to tree growth. U. S. Dept. Agr., Forest Service Bull. No. 92, 1911. 59 p. Bibl., p. 54-59.
- See also PHOTOCHEMISTRY.
- PHOTOTROPY**
- STOBEE, HANS. Phototropieerscheinungen. Ber. Verhandl. Sächs Akad. Wiss. Leipzig, 4: 161-250 (1922). Bibl., p. 164, 175, 192.
- PHTHALIC ACID**
- MEYER-JACOBSON. Orthophthalsäure. In their Lehrb. org. Chem. 2, pt. 1: 581-589 (1902).
- PHTHALIC ANHYDRIDE**
- PHILLIPS, M. Phthalic acid derivatives. J. Ind. Eng. Chem. 13: 247-249 (1921).
- PHYSICAL CHEMISTRY**
- BAUME, GEORGES. Revue de la chimie physique. J. chim. phys. 7: 245-259 (1909); 8: 426-445 (1910); 9: 423-474 (1911); 10: 354-413 (1912); 11: 327-404 (1913). Bibl. footnotes.
- BODLÄNDER, G. Fortschritte der physikalischen Chemie. Chem.-Z. 1: 533-535, 566-568, 596-599, 659-661 (1902); 113 footnotes. 2: 81-83, 112-114, 143-145; 396-397, 427-429, 459-461 (1903); 131 footnotes.
- HERZ, W. Die physikalische Chemie, 1903-1904. Chem.-Z. 3: 564-567, 709-710 (1904); 86 footnotes. 4: 128-131, 389-391 (1905); 91 footnotes.
- HERZ, W. Bericht ueber die Fortschritte der physikalischen Chemie. Chem.-Ztg. 34: 81-82, 89-91 (1910); 129 footnotes. 35: 49-50, 78-79, 86-88 (1911); 229 footnotes. 36: 77-78, 84-86, 111-112, 881-882, 894-896 (1912); 216 footnotes. 37: 109-110, 115-117 (1913); 111 footnotes. 38: 25-28, 42-46 (1914); 183 footnotes. 39: 133-135, 151-153 (1915); 174 footnotes. 40: 409-412, 423-425 (1916); 146 footnotes. 41: 497-498, 530-532, 550-552 (1917); 148 footnotes. 43: 57-58, 62-64, 75-77 (1919); 159 footnotes. 44: 61-62, 74-76, 94-96 (1920); 214 footnotes. 45: 341-342, 350-352, 389-391, 398-399, 421-423, 438-439 (1921); 324 footnotes. 46: 497-498, 522-523, 527-528, 569-570, 589-590, 613-616, 638-640, 662-664, 683-685 (1922); 526 footnotes. 47: 297-298, 301-303, 346-348, 391-393, 405-408, 470-472, 493-495, 514-515 (1923); 566 footnotes.
- JELLINEK, KARL. Lehrbuch der physikalischen Chemie. Stuttgart, Enke, 1914. 4 vols. Bibl. footnotes.
- NORDMEYER, P. Bericht ueber die Fortschritte der Physik und physikalischen Chemie. Chem.-Ztg. 30: 493-497 (1906); 219 footnotes. 31: 443-445, 463-465 (1907); 261 footnotes. 32: 425-426, 438-440 (1908); 106 footnotes. 33: 710-712, 726-728, 736-738 (1909); 151 footnotes.
- RUDOLPHI, M. Bericht ueber die Fortschritte der Physik und physikalischen Chemie. Chem.-Ztg. 27: 319-323 (1903); 166 footnotes. 29: 837-841 (1905). 183 footnotes.
- RUDOLPHI, M., and NORDMEYER, P. Bericht ueber die Fortschritte der Physik und physikalischen Chemie im Jahre 1903. Chem.-Ztg. 28: 445-450 (1904); 230 footnotes.
- SCHADE, HEINRICH. Die physikalische Chemie in der inneren Medizin; die Anwendung und die Bedeutung physikochemischer Forschung in der Pathologie und Therapie für Studierende und Ärzte. 3rd ed. Dresden, Steinkopff, 1923. 605 p. Bibl. footnotes.

PHYSICAL CHEMISTRY—Cont'd

- SCHWAB, G. M. Fortschritte in der physikalischen Chemie seit 1921. *Z. angew. Chem.* 37: 20-22, 32-35 (1924). 288 footnotes.
- TAYLOR, HUGH S. A treatise on physical chemistry. 2 vols. New York, Van Nostrand, 1924. Bibl. footnotes.
- TRAUBE, J. Jahresbericht ueber die Fortschritte der physikalischen Chemie und Physik im Jahre 1901. *Chem.-Ztg.* 26: 747-752 (1902); 105 footnotes.

Serial

- Beiblätter zu den Annalen der Physik. 1877-. . . Contains a section on physical chemistry.
- Physikalisch-chemisches Centralblatt. 1904-1912. Covers radioactivity, chemical statics and dynamics, electrochemistry, photochemistry, thermochemistry, colloids, metallography, analytical, apparatus.
- Science Abstracts. 1898-. . . Contains a section of physical chemistry.
- Zeitschrift für physikalische Chemie, Stöchiometrie und Verwandtschaftslehre. The first 56 volumes (1887-1905) contained an abstract section.

PHYSICAL PROPERTIES

- CARNELLEY, THOMAS. Melting and boiling point tables. London, Harrison, 1885-1887. 2 vols. 796 p. Values and authority. About 50,000 data.
- LANDOLT-BÖRNSTEIN. Physikalisch-chemische Tabellen. 5th ed. Berlin, Springer, 1923. 2 vols. Numerous bibls. through the work.
- Tables annuelles de constantes et données numériques de chimie, de physique et de technologie. Vol 1+. 1910 to date. Contains references to all published numerical data of chemistry, physics and engineering since 1910.

See also DENSITY, ELECTRICAL CONDUCTIVITY, HARDNESS, SPECIFIC HEAT, ETC.

PHYSIOLOGICAL CHEMISTRY

- ABDERHALDEN, EMIL. Lehrbuch der physiologischen Chemie in Vorlesungen. 4th ed. Berlin, Urban, 1920. 2 vols. Bibl. footnotes.
- BAYLISS, WM. M. Principles of general physiology. 3rd ed. London, Longmans, 1920. 862 p. Bibl., p. 741-827.
- BAYLISS, W. M. Colloid chemistry in physiology. In Second report on colloid chemistry, 1918, p. 122, 135, 142, 150, 154.

- BAYLISS, W. M., and STARLING, E. H. Die chemische Koordination der Funktionen des Körpers. *Ergeb. Physiol.* 5: 664-666 (1906). 77 references. Discusses respiration, digestion, etc.
- BERG, WM. N. Die Beziehung zwischen der physiologischen Wirkung der Ionen und ihrer physiko-chemischen Eigenschaften. *Ion* 2: 161-188 (1910). 117 footnotes.
- CHEMICAL SOCIETY. Physiological chemistry. In Annual reports on the progress of chemistry, vol. 1+. 1904 to date. Bibl. footnotes.
- FRÄNKEL, SIGMUND. Stereochemische Konfiguration und physiologische Wirkung. *Ergeb. Physiol.* 3: 290-291 (1904). 37 references.
- JOLLES, ADOLF. Jahresbericht ueber die Fortschritte auf dem Gebiete der physiologischen Chemie. *Chem.-Ztg.* 30: 524-528 (1906); 166 footnotes. 31: 580-582, 591-593 (1907); 131 footnotes.
- LIEBERMANN, H. Fortschritte der physiologischen Chemie im Jahre 1909. *Z. angew. Chem.* 23: 1155-1159 (1910). 68 footnotes.
- MATHEWS, ALBERT P. Physiological chemistry, a text-book and manual for students. 3rd ed. New York, Wood, 1920. 1154 p. Bibl. at end of chapters.
- PARSONS, THOMAS R. Fundamentals of biochemistry in relation to human physiology. Cambridge, Heffer, 1923. 281 p. Bibl. at end of chapters.
- PINCUSOHN, L. Physiologische Chemie. Fortschritte Chem. 1: 192-199, 376-384 (1909); 2: 391-400 (1910); 3: 361-376 (1910-1911); 4: 195-209 (1911); 5: 189-206 (1912); 6: 319-332 (1912-1913); 8: 141-157, 209-225 (1913); 9: 249-268 (1914); 17: 33-62 (1921). References through text.
- RAMSDEN, W. Colloidal and capillary phenomena in their bearing on physiology and biochemistry. In First report on colloid chemistry, p. 85-86 (1917). A few general references.
- SCHULZ, FR. N. Die physiologische Chemie. *Chem. Z.* 3: 106-108, 132-136, 168-172 (1904); 105 footnotes. 4: 1-5, 32-38, 537-539, 553-561 (1905); 238 footnotes.
- See also BIOCHEMISTRY.
- PHYTIN**
- "Phytin." *Ind.-Cat. S. G. O.*, 2nd ser., 13: 352 (1908).
- ROSE, ANTON R. Résumé of the literature on inositol phosphoric acid, with special reference to the relation of that substance to plants. *Biochem. Bull.* 2: 46-49 (1912). 62 references.

- THOMPSON, ALICE R. Organic phosphoric acid of rice. *J. Agr. Res.* 3: 425-430 (1915). 14 references.
See also PHOSPHORUS, ORGANIC COMPOUNDS.
- PHYTOSTEROL.** *See* CHOLESTEROL.
- PICOLINE**
 MEYER-JACOBSON. Picoline. *In their* Lehrb. org. Chem. 2, pt. 3: 806-807 (1917).
- PICRIC ACID**
 MEYER-JACOBSON. Pikrinsäure. *In their* Lehrb. org. Chem. 2, pt. 1: 382 (1902).
 "Picric acid." *Ind.-Cat. S. G. O.*, 1st ser., 1: 75 (1880); 2nd ser., 1: 117 (1896); 3rd ser., 1: 124-125 (1918). Includes toxicology.
See also EXPLOSIVES.
- PICROTOXIN**
 "Picrotoxin." *Ind.-Cat. S. G. O.*, 1st ser., 11: 294 (1890); 2nd ser., 13: 359 (1908).
- PIEZOCHEMISTRY**
 COHEN, ERNST, and SCHUT, W. Piezochemie kondensierter Systeme. Leipzig, Akad. Verlags, 1919. 449 p. Bibl. footnotes and bibls., p. 434-437.
- PIGMENTS: Animal.**
 FISCHER, HANS. Farbstoffe mit Pyrrolkernen. *In* Oppenheimer, Handb. Biochem. 1: 351-404 (1924). 126 footnotes.
 FURTH, O. Melanine, Lipochrome, Farbstoffe der Wirbellosen. *In* Oppenheimer, Handb. Biochem., 2nd ed., 1: 944-960 (1924). 74 footnotes.
 KAYSER, HEINRICH G. J. Tierische Farbstoffe. *In his* Handb. der Spectroscopie 4: 194-202 (1908). 214 references.
 OBERNDORFER, S. Pigment und Pigmentbildung. *Ergeb. Path.* 12: 460-498 (1908). References through text.
 "Pigments and pigmentation." *Ind.-Cat. S. G. O.*, 1st ser., 11: 303-304 (1890); 2nd ser., 13: 367-369 (1908).
 PRZIBRAM, HANS. Grüne tierische Farbstoffe. *Arch. ges. Physiol.* 153: 385-400 (1913). Bibl. footnotes.
 SAMUELY, FRANZ, and STRAUSS, EDUARD. Tierische Pigmente und Farbstoffe. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 731-790 (1922). Bibl. footnotes.
See also BACTERIAL PIGMENTS, BLOOD, BILE, HEMOGLOBIN, MELANINE, ETC.
- PIGMENTS: Plant.**
 HOROWITZ, B. Plant pigments—their color and interrelationships. *Biochem. Bull.* 4: 161-172 (1915). 37 footnotes.
 KAYSER, HEINRICH G. J. Natürliche Farbstoffe der Pflanzen. *In his* Handb. der Spectroscopie, 4: 6-21 (1908). 450 references.
 RUPE, H., and ALTENBURG, H. Übrige Pflanzenfarbstoffe. *In* Abderhalden, Biochem. Handl. 6: 23-187 (1911). Bibl. footnotes.
 WAKEMAN, NELLIE A. Pigments of flowering plants. *Wis. Acad. Sci., Arts Letters* 19: 767-906 (1919). Bibl. footnotes. Bibl. through text.
 WEST, C. J. Plant pigments (other than chlorophyll). *Biochem. Bull.* 4: 151-160 (1915). 36 footnotes.
 WILLSTÄTTER, RICHARD. Ueber Pflanzenfarbstoffe. *Ber.* 47: 2831-2874 (1914). Bibl. footnotes.
See also ANTHOCYANS, CAROTIN, CHLOROPHYLL, ETC.
- PILOCARPINE**
 "Pilocarpine." *Ind.-Cat. S. G. O.*, 1st ser., 11: 309-313 (1890); 2nd ser., 13: 374-376 (1908).
- PIMELIC ACID**
 MEYER-JACOBSON. Pimelinsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 401-402 (1913).
- PINABIETIC ACID**
 VIRTANEN, ARTHUR I. Die Konstitution der Pinabietinsäure. *Ann.* 424: 150-215 (1921). 75 footnotes.
See also ABIETIC ACID.
- PINACONE**
 MEYER-JACOBSON. Pinakon. *In their* Lehrb. org. Chem. 1, pt. 2: 86-89 (1913). 40 references.
- PINEAL GLAND**
 McCORD, CAREY P. Physiology, physiological chemistry and experimental pathology (of the pineal gland). *In* Barker, Endocrinology and metabolism 2: 7-32; references, 5: 161-166 (1922).
- PINENE**
 BARTELT, K. Pinen. *In* Abderhalden, Biochem. Handl. 7: 304-328 (1912). 225 footnotes.
 MEYER-JACOBSON. Pinen. *In their* Lehrb. org. Chem. 2, pt. 1: 983-998 (1902). Bibl. footnotes.
- PIPERAZINE**
 MEYER-JACOBSON. Piperazin. *In their* Lehrb. org. Chem. 2, pt. 3: 1351-1355 (1920).
 "Piperazine." *Ind.-Cat. S. G. O.*, 2nd ser., 13: 384-385 (1908).
- PIPERIDINE**
 KAUTZSCH, KARL. Piperidin. *In* Abderhalden, Biochem. Handl. 1: 1437-1447 (1911). 115 references.
 MEYER-JACOBSON. Piperidin. *In their* Lehrb. org. Chem. 2, pt. 3: 818-829 (1917). Bibl. footnotes.
 "Piperidine." *Ind.-Cat. S. G. O.*, 1st ser., 11: 324 (1890); 2nd ser., 13: 385 (1908).

PIPERONAL

WITTE, E. Piperonal. Heliotropin. In Abderhalden, Biochem. Handl. 1: 842-844 (1911). 50 references.

PITCH. See ASPHALT, COAL TAR, WOOD DISTILLATION.**PITUITARY**

FAUST, EDWIN S. Hypophyse. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 7, 1st half: 771-774 (1923). Bibl. footnotes. 29 references.

"Pituitary body, extract." Ind.-Cat. S. G. O., 2nd ser., 13: 396-397 (1908).

ROTH, GEORGE B. Pituitary standardization. U. S. Hyg. Lab., Bull. No. 109, 1917. Bibl., p. 32-33. 26 references.

PLACENTA

"Chemical composition of the placenta." Ind.-Cat. S. G. O., 2nd ser., 13: 405 (1908). 9 references.

GIESY, PAUL M. A chemical study of the placental hormone. Thesis, Columbia Univ., 1920. 84 p. Bibl., p. 82-83.

HAMMETT, FREDERICK S. The functions of the internal secretions of the placenta. Endocrinology 3: 307-317 (1919). 55 references.

PLANT JUICES

CLEVENGER, CLINTON B. Hydrogen ion concentration of plant juices. Soil Science 8: 217-226, 227-242 (1919). 53 references.

PLANT SLIMES

GRAFE, VIKTOR. Pflanzenschleime. In Abderhalden, Biochem. Handl. 2: 65-80 (1911); 8: 15-18 (1915). About 150 references.

PLANT TOXINS

TRUOG, E., and SYKORA, J. Soil constituents which inhibit the action of plant toxins. Soil Science 3: 333-351 (1917). 48 references.

PLANTS: Chemicals, action of. See FERTILIZERS.**PLANTS: Biochemistry.**

CZAPEK, FRIEDRICH. Ueber einige bemerkenswerte Fortschritte auf dem Gebiete der Pflanzen-Biochemie im Jahre 1901. Ergeb. Physiol. 1: 747-749 (1902). 48 references.

CZAPEK, F. Der Stickstoff im Stoffwechsel der Pflanze. Ergeb. Physiol. 2: 639-672 (1903); bibl. footnotes. 3: 309-310 (1904); 81 references.

CZAPEK, FRIEDRICH. Die organische Ernährung bei höheren grünen Pflanzen. Naturwissenschaften 8: 226-231 (1920). 44 footnotes.

MANGHAM, S. Observations on the osazone method of locating sugars in plant tissues. Ann. Bot. (London) 29: 369-391 (1915).

MONTEMARTINI, LUIGI. Sulla nutrizione e riproduzione nelle piante. Introduzione. Bibliografica. Atti Ist. Bot. Univ. Pavia, (2) 14: 92-106 (1910).

RAVIN, PAUL. Nutrition carbonée des plantes a l'aide des acides organiques libres et combinés. Ann. Sci. Nat. Bot. (9) 18: 440-446 (1913).

See also BOTANICAL CHEMISTRY.

PLANTS: Medicinal.

ADAMS, J. Medicinal plants and their cultivation in Canada. Canada Exptl. Farms, Bull. No. 23, 1915. 60 p.

KILMER, F. B. The cultivation of medicinal plants. Am. J. Pharm. 87: 343-359, 421-435 (1915).

SCHNEIDER, ALBERT. Literature on medicinal plants and drug plant culture. Pharm. Rev. 26: 201-214, 236-245 (1908).

See also DRUGS.

PLASTERS. See CEMENTS, GYPSUM, ETC.**PLASMA**

"Chemistry of blood plasma." Ind.-Cat. S. G. O., 3rd ser., 3: 83-84 (1922).

FISCHER, H. W. Das Wasser im Plasma. Kolloid-Z. 8: 291-302 (1911). 40 footnotes.

See also BLOOD.

PLASTICS: Synthetic.

BAEKELAND, L. H. The synthesis, constitution and uses of bakelite. J. Ind. Eng. Chem. 1: 149-161 (1909); Chem.-Ztg. 33: 317-318, 326-328, 347-348, 358-359 (1909). 31 footnotes.

BAEKELAND, L. H. Phenol-formaldehyde condensation products. J. Ind. Eng. Chem. 4: 737-743 (1912); Chem.-Ztg. 36: 1245-1249 (1912). Bibl. footnotes.

BAEKELAND, L. H. Die chemische Zusammensetzung von harzartigen Phenolkondensationsprodukten. Z. angew. Chem. 26: 473-478 (1913). 32 footnotes.

BAEKELAND, L. H., and BENDER, H. L. Phenol resins and resinoids. Ind. Eng. Chem. 17: 237 (1925). 67 references.

BLÜCHER, HANS. Plastische Massen; die Erzeugung, Verarbeitung und Verwendung von Kunststoffen. Leipzig, Hirzel, 1924. 291 p. Bibl., p. x-xii.

ELLIS, CARLETON. Synthetic resins and their plastics. New York, Chem. Cat. Co., 1923. 514 p. Bibl. footnotes.

FISCHER, E. J. Hartgummiersatzmassen ohne Kautschukzusatz. Kunststoffe 8: 2-7 (1918). Patents.

HALEN, S. Die neuen patentierten Verfahren zur Herstellung von plastischen Massen. *Kunststoffe* 4: 285-287, 354-356, 365-368 (1914). Patents.

HALEN, S. Die Herstellung von plastischen Massen aus Kasein. *Kunststoffe* 4: 301-302 (1914). Patents.

HALEN, S. Verfahren zur Herstellung plastischen Massen. *Kunststoffe* 9: 62-65, 78-81 (1919). Covers war patents.

HALEN, S. Tabellarische Uebersicht der deutschen Reichspatente betreffend die Verfahren zur Herstellung von Kunstharzen und Kunststoffen aus Phenolen und Aldehyden. *Kunststoffe* 14: 17-20, 38-40 (1924). 97 patents.

HALLE, —. Die Herstellung der Formaldehydharze. *Kunststoffe* 7: 149-152, 167-169 (1917). 56 patents and literature references.

HEMMING, EMILE. *Plastics and moulded electrical insulation*. New York, Chem. Cat. Co., 1923. 313 p. Patent references through book.

KAUSCH, OSKAR. Verfahren zur Herstellung plastischer Massen. *Kunststoffe* 1: 62, 86, 109, 131, 170, 226, 250, 270, 290, 311, 334, 349 (1911). Patents.

KAUSCH, OSKAR. Verfahren zur Herstellung von Kunstharze u. dgl. aus Phenol und Formaldehyd. *Kunststoffe* 3: 301-302 (1913); 4: 268-269 (1914). Patents.

LEBACH, H. Bakelite und seine Verwendung. *Chem.-Ztg.* 37: 733-736, 750-752 (1913); *J. Soc. Chem. Ind.* 32: 559-563 (1913). 50 footnotes.

MARSCHALK, J. Herstellung plastischer Massen mittels harzhaltiger Stoffe. *Kunststoffe* 7: 120-125 (1917). 81 references.

MARSCHALK, J. Herstellung plastischer Massen aus Leim, u. dgl. *Kunststoffe* 7: 136-140, 155-159, 173-177 (1917). 215 patents.

REDMAN, L. V., WEITH, A. J., and BROCK, F. P. Bibliography of phenols, methylenes and their condensation products. *J. Ind. Eng. Chem.* 6: 15-16 (1914).

See also PYROXYLIN.

PLASTICITY

BINGHAM, E. C. Fluidity and plasticity. New York, Chem. Cat. Co., 1922. 440 p. Bibl., p. 347-429.

LEHMANN, O. Plastizität fester Kristalle und erzwungene Homoötropie I und II Art. *Ann. Phys.* 50: 555-559 (1916). Bibl. footnotes.

PLATINUM

CHAVANNE, —. Platine. In Moissan, *Chim. min.* 5: 717-851 (1906). 528 footnotes.

FRIEND, J. N. Platinum. In *his* Textbook, 9, pt. 1: 256-329 (1920). Bibl. footnotes.

GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Platinum and allied metals. London, 1922. 84 p. Bibl., p. 78-84.

GUTBIER, A., and WAGNER, A. Ueber kolloides Platin. *Kolloid-Z.* 19: 298-302 (1916). 53 footnotes.

HALEN, S. Neue Mitteilungen und Arbeiten ueber das Platin. *Edel-Erden u. -Erze* 2: 56-59 (1921). References through text, covering 1917-1920.

HOWE, J. L., and HOLTZ, H. C. Bibliography of the metals of the platinum group: platinum, palladium, iridium, rhodium, osmium, ruthenium, 1748-1917. *U. S. Geol. Sur., Bull.* No. 694, 1919. 558 p. Revision of Smithsonian Misc. Pub. No. 1084 (1897). The part on assaying appears in *Bur. Mines, Tech. Paper* No. 270 (1921).

KUNZ, GEO F. Platinum. *Mineral Ind.* 30: 554-573 (1921). 20 references.

LOWENSTEIN, W. Platin. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3 (1915). 992 p. Bibl. through text.

LUMB, A. D. The platinum metals. London, Murray, 1920. Bibl., p. 60-63. 90 references.

PLATINUM: Analysis.

DAVIS, C. W. The detection and estimation of platinum in ores. *U. S. Bur. Mines, Tech. Paper* No. 270, 1921. 27 p. Bibl., p. 23-25. 34 references.

LOWENSTEIN, W. Platin- Analytisches. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 240-247 (1915).

PLATINUM: Catalytic action.

LOWENSTEIN, W. Platin: Katalytische Wirkungen. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 129-164 (1915).

See also HYDROGENATION, CATALYSIS.

PLATINUM ALLOYS

LOWENSTEIN, W. [Platinum alloys.] In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 759+ (1915). Ag, p. 963; Al, p. 872; As, p. 893; Ba, p. 838; Bi, p. 901; Ca, p. 855; Cd, p. 908; Co, p. 946; Cr, p. 879; Cu, p. 955; Fe, p. 935; Hg, p. 984; In, p. 910; K, p. 759; Mg, p. 863; Mn, p. 890; Mo, p. 887; Ni,

PLATINUM ALLOYS—Cont'd

p. 942; Pb, p. 927; Sb, p. 897; Si, p. 876; Sn, p. 911; Te, p. 899; Th, p. 921; Ti, p. 875; U, p. 889; V, p. 889; W, p. 884; Zn, p. 901.

See also PLATINUM (Howe).

PLATINUM AMMINES

JORGENSEN, S. M. Zur Konstitution der Platinbasen. *Z. anorg. Chem.* 24: 153-182 (1900); 25: 353-377 (1900). 50 footnotes.

LOWENSTEIN, W. Platiäke. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 429-758 (1915).

PLATINUM CHLORIDES

LOWENSTEIN, W. Platin und Chlor. Platinchloride. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 285-297 (1915).

PLATINUM OXIDES

LOWENSTEIN, W. Platin und Sauerstoff. In *Gmelin-Kraut, Handb. anorg. Chem.* 5, pt. 3: 248-263 (1915).

PLATINUM SUBSTITUTES

MOCK, H., and BLUM, A. Abridgement of U. S., British and German patents on alloys, covering the production of platinum substitutes, including alloys having certain of the properties of platinum. New York, Moch and Blum, 1918. 319 p.

PLATINUM WARES

BURGESS, GEORGE K., and SALE, P. D. Study of the quality of platinum ware. U. S. Bur. Standards, Sci. Paper No. 254, 1915. 28 p. 18 references, 11 of which are annotated.

PODOPHYLLIN

"Podophyllum and podophylline." *Ind.-Cat. S. G. O.*, 2nd ser., 13: 588-589 (1908).

POISON GASES. See CHEMICAL WARFARE.**POISONING: Industrial.**

CURSCHMANN, FRITZ. [Industrial poisoning by benzene and its derivatives.] *Deut. Vierteljahresschr. oeffentl. Gesundheitspflege* 43: 242 (1911). 29 references.

DAVIS, PAUL A. Aniline poisoning in the rubber industry. *J. Ind. Hyg.* 3: 57-61 (1921).

DRINKER, F. Certain aspects of the problem of zinc toxicity. *J. Ind. Hyg.* 4: 194-197 (1922).

EDSALL, DAVID L., WILBUR, F. P., and DRINKER, CECIL K. Occurrence, cause and prevention of chronic manganese poisoning. *J. Ind. Hyg.* 1: 183-193 (1919). 20 references.

GLAISTER, JOHN, and LOGAN, D. D. Gas poisoning in mining and other industries. Edinburgh, Livingstone, 1914. 550 p. 12 p. of bibl.

HAMILTON, ALICE. Industrial poisoning by compounds of the aromatic series. *J. Ind. Hyg.* 1: 200-212 (1919). 22 references.

HAMILTON, ALICE. Inorganic poisons other than lead in American industries. *J. Ind. Hyg.* 1: 89-102 (1919). 38 references.

HAMILTON, ALICE. Lead poisoning in American industry. *J. Ind. Hyg.* 1: 8-21 (1919). 31 references.

HAYTHORN, SAMUEL R. Experimental TNT poisoning. *J. Ind. Hyg.* 2: 298-318 (1920). 27 references.

KOBER, GEORGE M., and HAYHURST, EMERY R. Industrial health. Philadelphia, Blakiston, 1924. 1184 p. Carbon disulfide, p. 367-368; 33 references. Carbon monoxide, p. 409-411; 67 references. Arsenic, p. 313-314, 320. Copper, p. 327. Zinc, p. 339-340; 54 references. Brass, p. 351-352; 29 references. Lead, p. 469-470; 23 references. Mercury, p. 494; 16 references.

M McNALLY, W. D. Carbon monoxide poisoning. *J. Am. Med. Assoc.* 69: 1586-1590 (1917). 38 references.

MINOT, GEORGE R. Blood examination of trinitrotoluene workers. *J. Ind. Hyg.* 1: 301-318 (1919). 19 references.

MITCHELL, CLAUDE W., and DAVENPORT, S. J. Hydrogen sulfide literature. U. S. Public Health Repts. 39: 10-13 (1924). 84 references.

"Poisoning by carbon disulfide." *Ind.-Cat. S. G. O.*, 1st ser., 2: 701 (1881); 2nd ser., 3: 158-159 (1898); 3rd ser., 3: 847 (1922).

"Poisonous colors." *Ind.-Cat. S. G. O.*, 1st ser., 3: 312-313 (1882); 2nd ser., 3: 780 (1898).

RAMBOUSEK, JOSEF. Industrial poisoning from fumes, gases and poisons of manufacturing processes. London, Arnold, 1913. 360 p. Bibl., p. 339-354.

SHIE, MARVIN D., and DEEDS, F. E. Importance of tellurium as a health hazard in industry. A preliminary report. *Public Health Repts.* 35: 939-954 (1920); Reprint No. 590. 18 p. Bibl., p. 17-18.

VOEGTLIN, CARL, HOOPER, C. W., and JOHNSON, J. M. Trinitrotoluene poisoning—its nature, diagnosis and prevention. U. S. Hyg. Lab., Bull. No. 126: 38-40 (1920). 50 references.

See also LEAD POISONING.

POISONS: Animal.

BARGER, GEORGE. Poisons and drugs of animal origin. *J. Soc. Chem. Ind.* 37: 34-35T (1918). 30 references.

- FAUST, EDWIN S. Tierische Gifte. In Abderhalden, Biochem. Handl. 5: 453-494 (1911). Bibl. footnotes.
- FAUST, EDWIN S. Die tierische Gifte. Braunschweig, Vieweg, 1906. 248 p.
- FAUST, EDWIN S. Darstellung und Nachweis tierischer Gifte. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 7, 1st half: 753-928 (1923). Bibl. footnotes.
- FAUST, EDWIN S. Tierische Gifte. In Heffter, Handb. exp. Pharmakologie, 2, 2nd half: 1748-1931 (1924). Bibl. footnotes.
- FLURY, F. Tierische Gifte. Naturwissenschaften 7: 619 (1919). 24 references.
- MAAS, TH. A. Tierische Gifte. In Oppenheimer, Handb. Biochem. 3, pt. 1: 742-775 (1910). 232 footnotes.
- "Poisons, mineral and vegetable." Ind.-Cat. S. G. O., 1st ser., 11: 469-476 (1890); 2nd ser., 13: 597-603 (1908).
- See also PTOMAINES, VENOMS.
- POISONS: General.**
- "Arrow-poison." Ind.-Cat. S. G. O., 1st ser., 1: 563-564 (1880); 2nd ser., 1: 671-672 (1896); 3rd ser., 2: 8-9 (1920).
- BLYTH, ALEXANDER W., and BLYTH, M. W. Poisons: Their effects and detection. 5th ed. New York, Van Nostrand, 1920. 779 p.
- HAUSMAN, W. Die Gewohnung an Gifte. Ergeb. Physiol. 6: 58-63 (1907). 135 references.
- POISONS: Vegetable.**
- BRENCHLEY, WINIFRED E. Inorganic plant poisons and stimulants. Cambridge, Univ. Press, 1914. 110 p. Bibl., p. 97-106.
- McNAIR, JAMES B. A study of *Rhus diversiloba*, with special reference to its toxicity. Am. J. Bot. 8: 127-146 (1921). 64 references.
- McNAIR, JAMES B. Transmission of rhus poison from plant to person. Am. J. Bot. 8: 238-250 (1921). 49 references.
- McNAIR, JAMES B. Rhus dermatitis from *Rhus toxicodendron*, *radicans* and *diversiloba* (poison ivy). Chicago, Univ. Chicago Press, 1923. 298 p. 77 p. of bibl.
- PAMMEL, L. H. A manual of poisonous plants. II. Cedar Rapids, Iowa, 1911. 977 p. 1000 references.
- Vegetable drugs and poisonous plants. Bull. Imp. Inst. 13: 28-65 (1915). References through text.
- POLARISCOPE**
- ROLFE, GEORGE W. The polariscope in the chemical laboratory; an introduction to polarimetry and related methods. New York, Macmillan, 1905. 320 p. Bibl., p. 279-283.
- SIDERSKY, D. Polarisation et saccharimétrie. 2nd ed. Paris, Gauthiers, 1908. 168 p. Bibl., p. 161-164.
- See also OPTICAL ACTIVITY.
- POLENSKE NUMBER**
- FRITZSCHE, MARTIN. Die bisherigen Erfahrungen und Urteile über die Polenske'sche Zahl und ein Beitrag zur Kenntniss derselben bei holländischer Versandbutter. Z. Nahr.-Genussm. 15: 193-233 (1908). Bibl. footnotes.
- POLLEN**
- PATON, JULIA B. Pollen and pollen enzymes. I. The theoretical and practical aspects of the occurrence of pollen enzymes. Am. J. Bot. 8: 471-501 (1921). 57 references.
- POLONIUM**
- LUCAS, RICHARD. Polonium. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 35-36 (1908).
- POLYMERIZATION**
- WALDEN, P. Ueber den Molekularzustand binärer Salze in schwachionisierenden Lösungsmitteln. Beiträge zur Solvolyse und Polymerie. Z. physik. Chem. 94: 295-373 (1920). Bibl. footnotes.
- POLYMETHYLENES**
- ASCHAN, OSSIAN. Chemie der alicyclischen Verbindungen. Braunschweig, Vieweg, 1905. 1163 p. Bibl. footnotes.
- BAUM, FRITZ. Polymethylene und Terpene. In Abderhalden, Biochem. Handl. 1: 131-151 (1911). 175 footnotes.
- SLOCUM, EDWARD M. The reactions of polymethylene derivatives in the preparation of higher olefine primary alcohols. Thesis, Columbia Univ., 1924. 46 p. Bibl., p. 41-44.
- POLYPEPTIDES**
- ABDERHALDEN, EMIL. Abbau der Proteine. In Oppenheimer, Handb. Biochem. 1: 347-437 (1909). 162 footnotes.
- MEYER-JACOBSON. Polypeptide. In their Lehrb. org. Chem. 1, pt. 2: 742-746 (1913). Bibl. footnotes.
- RASKE, KARL. Polypeptide. In Abderhalden, Biochem. Handl. 4: 211-359 (1910). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Polypeptide. In Abderhalden, Biochem. Handl. 11: 1-46 (1924). Bibl. footnotes.
- ZEMPLÉN, GÉZA, and FUCHS, D. Polypeptide. In Abderhalden, Biochem. Handl. 9: 37-64 (1915). Bibl. footnotes.

POLYTHIONIC ACIDS

- LINNE, BR. Polythionsäuren. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 587-614 (1907). References through text. Includes the di-, tri-, tetra- and pentathionic acids.

PORCELAIN

- GRELLIER, CAMILLE. L'industrie de la porcelaine en Limousin: ses origines—son évolution. Thesis, Paris, 1908. 511 p. Bibl., p. 502-508.
- KLEIN, A. A. Constitution and micro-structure of porcelain. Trans. Am. Ceram. Soc. 18: 377-423 (1916). 13 references.
- RIEKE, REINHOLD. Die Chemie des Porzellans. In Doelter, Handb. Mineralchem. 2, pt. 2: 94-120 (1917). Bibl. footnotes.

See also CERAMICS, GLASS.

POTASH

- Alunite deposits of Australia and their utilization. Advisory Council Sci. Ind., Australia, Bull. No. 3, 1917. 38 p.
- BECKMAN, J. W. Potash. Mineral Ind. 25: 602-607 (1916); 26: 556-573 (1917); 27: 582-603 (1918). 44 references.
- BERRY, R. A., and McARTHUR, D. N. Recovery of potash from blast furnace dust. J. West Scotland Iron Steel Inst., 1917-1918; 36 p. Bibl. p. 25-28. See also J. Soc. Chem. Ind. 37: 5T (1918); 20 references.
- BRADLEY, LINN. Recovery of potash from blast furnace and cement kilns by electrical precipitation. J. Ind. Eng. Chem. 10: 837-838 (1918). 38 references.
- BROWN, FREDERICK W. Potash. Mineral Ind. 28: 568-583 (1919); 29: 565-575 (1920); 30: 574-579 (1921); 31: 581-585 (1922). About 60 references.
- BRUCKMILLER, F. W. Literature of the potash industry, 1912-1917. Chem. Met. Eng. 19: 447-449 (1918). 159 references, classified according to the source of the potash.
- BUCK, E. C. Bibliography of the extraction of potash from complex mineral silicates, such as feldspar, leucite and glauconite. Met. Chem. Eng. 18: 33-37, 90-95 (1918). 250 references.
- ERDMANN, E. Die Entstehung der Kalisalzlagertstätten. Z. angew. Chem. 21: 1685-1702 (1908). 92 footnotes.
- GALE, H. S. Potash. U. S. Geol. Sur., Mineral Resources, 1916, pt. 2: 73-171. 230 references, 1848-1917. Special bibl. references through text.
- GALE, H. S. The potash deposits of Alsace. U. S. Geol. Sur., Bull. 715B, p. 49-55 (1920). 25 annotated references.
- GALE, H. S., and HICKS, W. B. Potash in 1917. U. S. Geol. Sur., Mineral Resources, 1917, pt. 2: 467-481. 421 references, 1830-1918. Classified. Chronological.
- HAGEN, MAX. Fortschritte auf dem Gebiete der Kali Industrie. Chem.-Ztg. 27: 747-749 (1903); 14 footnotes. 28: 206-209 (1904); 25 footnotes.
- HICKS, W. B., and NOURSE, M. R. Potash in 1919. U. S. Geol. Sur., Mineral Resources 1919, pt. 2: 87-94. Bibl. for 1918-1919. Includes list of patents for processes of extracting potash from silicate rocks.
- HOF, HANS. Fortschritte der Kaliindustrie. Chem.-Ztg. 34: 444-445 (1910); 89 footnotes. 37: 401-404 (1913); 131 footnotes. 38: 1045-1047 (1914); 83 footnotes. 40: 537-540 (1916); 120 footnotes. 41: 421-423 (1917); 63 footnotes. 43: 193-194, 201-203 (1919); 88 footnotes. 47: 805-806, 818-820 (1923); 133 footnotes.
- JOHNSTONE, SYDNEY J. Potash. 2nd ed. London, Murray, 1922. 122 p. Bibl., p. 114-122. 180 references.
- LIPPMANN, EDMUND O. v. Zur Geschichte der Pottasche und ihres Namens. Chem.-Ztg. 32: 977-978 (1908); 37 footnotes. 34: 1217-1219, 1226-1228, 1235-1237 (1910); 178 footnotes.
- MANSFIELD, GEORGE R. Potash in 1922. U. S. Geol. Sur., Mineral Resources, 1922, pt. 2: 104-107. Patents covering extraction from phosphate rock, p. 103.
- MELLOR, J. W. Occurrence and extraction of potash. In his Inorg. theor. chem. 2: 427-442 (1922). 250 references.
- NEUMANN, B., and DRAISBACH, F. Die Aufschliessung von Feldspat zum Zwecke der technischen Kaliegewinnung. Z. angew. Chem. 29: 313-319, 326-331 (1916). 83 references and complete list of patents for recovering potash from feldspar.
- NOURSE, M. R. Potash in 1920 and 1921. U. S. Geol. Sur., Mineral Resources 1920, pt. 2: 118-121; 1921, pt. 2: 59-63. References for 1919-1922.
- PHALEN, W. C. Potash salts. U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 106-107; 1914, pt. 2: 33-34; 1915, pt. 2: 132-133. 56 references.

- PHALEN, W. C. Salt resources of the United States. U. S. Geol. Sur., Bull. No. 669, 1919. 277 p. Bibl., p. 250-251.
- POMILIO, UMBERTO. La production de la potasse et de l'alumine a partir des leucites italiennes au moyen du chlore. *Chimie & Industrie* 7: 437 (1922). 50 references.
- VAN'T HOFF, J. H. Der Verband für die wissenschaftliche Erforschung der deutschen Kalisalzlagernstätten. Sitzber. k. Preuss. Akad. Wiss. 39: 772-786 (1910). Annotated references.
- WILSON, WILFRED W. G. Potash recovery at cement plants. Canada, Dept. Mines, Mines Br., Bull. No. 29, 1919. 34 p. Bibl., p. 32-34. 50 references, 1911-1919.
- WYSOR, R. J. Potash as a by-product from the blast furnace. Trans. Am. Inst. Mining Eng. 56: 286-288 (1916). 45 references.
- See also FERTILIZERS.
- POTASSIUM**
- EPHRAIM, FRITZ. Kalium. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 1-187 (1906). References through text.
- DE FORCRAND, R. Potassium. In Moissan, Chim. min. 3: 25-184 (1904). 1175 footnotes.
- HINRICHSSEN, W. Kalium. In Abegg, Handb. anorg. Chem. 1, pt. 1: 405-413 (1907). 417 references.
- ROUSSEAU, M. Potassium. In Frémy, Enc. chim. 3, 2^e cahier: 208-220 (1887).
- WALKER, A. J. Potassium. In Friend, Textbook, 2: 152-187 (1924). Bibl. footnotes.
- See also ALKALI METALS (Mellor).
- POTASSIUM: Analytical.**
- CHRISTENSEN, HARALD R. Ueber die Bestimmung von Kalium in Erde und Düngemitteln. Landw. Verstat. 97: 56 (1920). 6 references.
- HIBBARD, P. L. A study of the determination of potash, chiefly concerned with the Lindo-Gladding method. J. Ind. Eng. Chem. 9: 512-513 (1917). 30 references.
- HOLGEN, H. J. Kaliumbespaligen. Chem. Weekblad. 14: 578-585 (1917). Bibl. footnotes.
- VURTHEIM, A. Biographie van de methoden voor Kali-onderzoek. Chem. Weekblad 15: 827-842 (1918). Bibl. footnotes.
- POTASSIUM: Physiological.**
- VOORMOLEN, C. M. Die Bedeutung des Kaliums im Organismus. Naturwissenschaften 7: 900 (1919). 22 references.
- ZWAARDEMAKER, H. Die Bedeutung des Kaliums im Organismus. Arch. ges. Physiol. 173: 28-77 (1918). Bibl. footnotes.
- POTASSIUM ALUMINIUM SILICATE**
- DOELTER, C. Kaliumaluminumsilicate. In his Handb. Mineralchem. 2, pt. 2: 408-579 (1917). Bibl. footnotes.
- JACOBY, R. Kaliumaluminumsilicate. Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 264-271 (1912).
- POTASSIUM ALUMINIUM SULFATE**
- EPHRAIM, FRITZ. Kaliumaluminiumsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 657-664 (1909).
- POTASSIUM BICARBONATE**
- WEGSCHEIDER, R. Kalicin. In Doelter, Handb. Mineralchem. 1: 207-209 (1912). 25 footnotes.
- See also POTASSIUM CARBONATE.
- POTASSIUM BISULFATE**
- BORNTAEGER, ARTURO. Della reazione tra solfato neutro di potassio ed acido tartrico in varia condizioni, come pure del comportamento del solfato acido di potassio verso l'alcool. Ann. chim. appl. 12: 21-23 (1919). 40 references.
- See also POTASSIUM SULFATE.
- POTASSIUM BROMIDE**
- EPHRAIM, FRITZ. Kaliumbromid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 107-111 (1906).
- "Potassium bromide." Ind.-Cat. S. G. O., 1st ser., 11: 532-535 (1890); 2nd ser., 13: 659 (1908).
- See also ALKALI METALS (Mellor).
- POTASSIUM CARBONATE**
- EPHRAIM, FRITZ. Kaliumkarbonat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 154-164 (1906).
- See also ALKALI METALS, POTASH.
- POTASSIUM CHLORATE**
- EPHRAIM, FRITZ. Kaliumchlorat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 100-107 (1906).
- See also CHLORIC ACID (Mellor).
- POTASSIUM CHLORIDE**
- EPHRAIM, FRITZ. Kaliumchlorid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 91-99 (1906).
- See also ALKALI METALS (Mellor).
- POTASSIUM CYANIDE**
- EPHRAIM, FRITZ. Kaliumcyanid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 177-182 (1906).
- "Potassium cyanide." Ind.-Cat. S. G. O., 1st ser., 11: 537-538 (1890); 2nd ser., 13: 660-661 (1908).
- POTASSIUM DICHROMATE**
- STERN, DORA. Kaliumdichromat. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 625-629 (1912).

POTASSIUM FERRICYANIDE

GRUBE, GEORG. Die elektrolytische Darstellung des Ferricyankaliums. Sammlung chem. chem.-tech. Vorträge 20: 167-278 (1913). Bibl. footnotes.

POTASSIUM FLUORIDE

EPHRAIM, FRITZ. Kaliumfluorid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 89-91 (1906).

See also ALKALI METALS (Mellor).

POTASSIUM HYDROXIDE

EPHRAIM, FRITZ. Kaliumhydroxyd. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 13-21 (1906).

See also ALKALI METALS (Mellor).

POTASSIUM IODIDE

EPHRAIM, FRITZ. Kaliumjodid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 113-122 (1906).

"Potassium iodide." Ind.-Cat. S. G. O., 1st ser., 11: 538-540 (1890); 2nd ser., 13: 661-662 (1908).

See also ALKALI METALS (Mellor).

POTASSIUM MOLYBDATE

KIESER, A. J. Kaliummolybdate. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 974-978 (1912).

POTASSIUM NITRATE

EPHRAIM, FRITZ. Kaliumnitrat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 30-38 (1906).

KAILAN, A. Kaliumnitrat. In Doelter, Handb. Mineralchem. 3, pt. 1: 282-289 (1918). Bibl. footnotes.

"Potassium nitrate." Ind.-Cat. S. G. O., 1st ser., 11: 541 (1890); 2nd ser., 13: 663-664 (1908).

See also ALKALI METALS (Mellor).

POTASSIUM PERCHLORATE

"Potassium perchlorate." Ind.-Cat. S. G. O., 1st ser., 11: 535-537 (1890); 2nd ser., 13: 660 (1908).

See also PERCHLORIC ACID.

POTASSIUM PERMANGANATE

EPHRAIM, FRITZ. Kaliumpermanganat. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 343-350 (1908).

"Potassium permanganate." Ind.-Cat. S. G. O., 1st ser., 11: 542 (1890); 2nd ser., 13: 664 (1908).

POTASSIUM SALTS

D'ANS, J. Kalisalze. In Bräuer and D'ANS, Fortschritte 1: 2687-2693 (1923). German patents.

DOLBEAR, S. H. Potassium salts. Mineral Ind. 23: 611-622 (1915).

POTASSIUM SILICATE

JACOBY, R. Kaliumsilikat. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 219-223 (1912).

See also POTASSIUM ALUMINIUM SILICATE, SILICATES.

POTASSIUM SULFATE

EPHRAIM, FRITZ. Kaliumsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 48-58 (1906).

See also ALKALI METALS (Mellor).

POTASSIUM SULFIDE

EPHRAIM, FRITZ. Kalium und Schwefel. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 38-45 (1906).

See also ALKALI METALS (Mellor).

POTASSIUM TARTRATE

EPHRAIM, FRITZ. Weinsäures Kalium. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 171-175 (1906).

POTASSIUM VANADATE

PRANDTL, W. Kaliumvanadat. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 132-140 (1908).

POTENTIAL, SINGLE

GIBBONS, V. L., and GETMAN, F. H. Potential of silver in non-aqueous solutions of silver nitrate. J. Am. Chem. Soc. 36: 1630-1655 (1914). Bibl. footnotes and chronological bibl. of 65 references.

KAHLENBERG, LOUIS, and MONTGOMERY, JOHN A. The effect of amalgamation upon the single potentials of the binary alloys of aluminium with copper, zinc and nickel. Trans. Am. Electrochem. Soc. 36: 289-322 (1919). Bibl. footnotes.

POTTERY. See CERAMICS, CLAYS, ETC.

PRASEODYMIUM. See RARE EARTHS.

PRECIPITATION, ELECTRICAL. See ELECTRICAL PRECIPITATION.

PRECIOUS METALS

VOISIN, JEAN. Les métaux précieux. Paris, 1922. 264 p.

See also GOLD, PLATINUM, SILVER, ETC.

PRECIOUS STONES

ESCARD, JEAN. Les pierres précieuses. Paris, Dunod, 1914. 520 p. Bibl., p. 461-510.

STERRETT, D. B. Precious stones. U. S. Geol. Sur., Mineral Resources 1906: 1251-1252. 27 references.

STODDARD, B. H. Gems and precious stones in 1919. U. S. Geol. Sur., Mineral Resources 1919, pt. 2: 179-180.

WADE, FRANK B. A textbook of precious stones. New York, Putnams, 1918. 318 p. Bibl., p. 301.

WODISKA, JULIUS. A book of precious stones. New York, Putnams, 1910. 365 p. Bibl., p. 307-342. 506 references.

PRECIPITINS

MICHAELIS, LEONOR. Die Präzipitine. In Oppenheimer, Handb. Biochem. 2: 552-591 (1908). 94 footnotes.

"Precipitins." Ind.-Cat. S. G. O., 2nd ser., 13: 687-688 (1908).

See also IMMUNITY.

PRESERVES. See CANNING AND PRESERVING.

PRESSURE: Internal. See INTERNAL PRESSURE.

PROLINE

ZEMPLÉN, GÉZA. Prolin. In Abderhalden, Biochem. Handl. 4: 722-726 (1911); 9: 157-159 (1915). 135 footnotes.

See also AMINO ACIDS.

PROPANE

BAUM, FRITZ. Propan. In Abderhalden, Biochem. Handl. 1: 77-86 (1911). 210 footnotes. Includes derivatives.

See also HYDROCARBONS.

PROPEPTONE

"Propeptone." Ind.-Cat. S. G. O., 2nd ser., 13: 838 (1908).

See also PEPTONE, PROTEINS.

PROPIONIC ACID

SCHMIDT, ERNST. Propionsäure. In Abderhalden, Biochem. Handl. 1: 951-953 (1911). 65 footnotes.

See also ACIDS, ORGANIC.

PROPNAL

"Propnal." Ind.-Cat. S. G. O., 2nd ser., 13: 838-839 (1908). 13 references.

PROPYL ALCOHOL

GERNGROSS, OTTO. Propylalkohol. In Abderhalden, Biochem. Handl. 1: 420-425 (1911). 110 references (includes derivatives).

WORDEN, E. C. Propyl alcohol. In his Technology of cellulose esters 1: 2428-2437 (1921). Bibl. footnotes.

See also ALCOHOLS.

PROPYLENE

BAUM, FRITZ. Propylene. In Abderhalden, Biochem. Handl. 1: 125-128 (1911). 55 references.

See also HYDROCARBONS.

PROPYLENE GLYCOL

MEYER-JACOBSON. Propylenglykol. In their Lehrb. org. Chem. 1, pt. 2: 85 (1913). 30 references.

PROTAGON. See CEREBROSIDES, LIPOIDS.

PROTAMINES

"Protamines." Ind.-Cat. S. G. O., 2nd ser., 13: 899 (1908).

ROLLETT, ADOLF. Protamine. In Abderhalden, Biochem. Handl. 4: 162-168 (1911). Bibl. footnotes.

PROTARGOL

"Protargol." Ind.-Cat. S. G. O., 2nd ser., 13: 899-900 (1908).

See also COLLARGOL.

PROTEINS

BAILEY, C. H., and BLISH, M. J. Identity of the proteins extracted from wheat flour by the usual solvents. J. Biol. Chem. 23: 345-357 (1915). 30 references.

BERGELL, PETER, and QUADE, FRITZ. Ueber neuere Arbeiten auf dem Gebiete der Eiweisskörper und ihre Spaltungsprodukte. Biochem. Centr. 6: 38-41 (1907).

CHICK, HARRIETTE, and MARTIN, C. J. The "heat coagulation" of proteins. J. Physiol. 40: 404; 43: 1; 45: 61, 261 (1910-1912); Kolloidchem. Beihefte 5: 138-140 (1913). 85 references.

COHN, EDWIN J. The solubility of certain proteins at their isoelectric points. J. Gen. Physiol. 4: 697-722 (1921-1922). 49 references.

COHNHEIM, O. Chemie der Eiweisskörper. 3rd ed. 1911. 388 p.

CZAPEK, FRIEDRICH. Die Proteide im pflanzlichem Stoffwechsel. Die Proteide im Stoffwechsel der Bakterien und Pilze. Die Proteide im Stoffwechsel der Blütenpflanzen. In his Biochemie der Pflanzen, 2nd ed., vol. 2: 1-326. 1920. Bibl. footnotes.

FRIEDMANN, E. Der Kreislauf des Schwefels in der organischen Natur. A. Ueber die Bindung des Schwefels im Eiweiss. Ergeb. Physiol. 1: 15-16 (1902). 48 references.

FÜRTH, O. v. Oxydative Abbauprodukte der Proteine. In Abderhalden, Biochem. Handl. 4: 207-210 (1911). Bibl. footnotes.

HANDOVSKY, HANS. Die neueren Fortschritte in der experimentellen Kolloidchemie der Eiweisskörper. Kolloid-Z. 7: 183-193, 267-277 (1910). 113 footnotes.

HANDOVSKY, HANS. Allgemeine Chemie der Proteine. In Oppenheimer, Handb. Biochem., 2nd ed., 1: 555-595 (1924). 136 footnotes.

HITCHCOCK, DAVID I. Proteins and the Donnan equilibrium. Physiol. Rev. 4: 529-531 (1924). 70 references.

HOFFMAN, WALTER F., and GORTNER, ROSS A. Physicochemical studies on proteins. 1. The prolamines—their chemical composition in relation to acid and alkali binding. In Colloid Symposium Mon., II: 359-368 (1925).

HOFMEISTER, F. Ueber Bau und Gruppierung der Eiweisskörper. Ergeb. Physiol. 1: 759-764 (1902). 147 references.

KOSSEL, A. Ueber die einfachsten Eiweisskörper. Biochem. Centr. 5: 1-8, 33-39 (1906). 64 references.

MANN, G. Chemistry of the proteids. New York, Macmillan, 1906. 606 p.

OSBORNE, THOMAS B. The vegetable proteins. New York, Longmans, 1924. 154 p. Bibl., p. 123-151.

PROTEINS—Cont'd

- OSBORNE, THOMAS B. Die Pflanzenproteine. *Ergeb. Physiol.* 10: 49-54 (1909). 219 references.
- OSBORNE, THOMAS B. Proteine der Pflanzenwelt. In *Abderhalden, Biochem. Handl.* 4: 1-50 (1910); 9: 1-32 (1915). About 400 footnotes.
- OSBORNE, THOMAS B., and STRAUSS, E. Darstellung der Proteine der Pflanzenwelt. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 8: 383-454 (1921). Bibl. footnotes.
- PAULI, WOLFGANG. Die kolloiden Zustandsänderungen der Eiweisskörper. *Fortschr. Naturw. Forsch.* 4: 270-272 (1912). 72 references.
- PLIMMER, R. H. The chemical constitution of the proteins. 3rd ed. Part 1. Analysis. New York, Longmans, 1917. 174 p. Bibl., p. 137-165. 2nd ed. Part 2. Synthesis. 1912. 107 p. Bibl., p. 91-104.
- "Proteins." *Ind.-Cat. S. G. O.*, 1st ser., 11: 713-714 (1890); 2nd ser., 13: 900-903 (1908).
- ROBERTSON, T. B. The physical chemistry of the proteins. New York, Longmans, 1918. 483 p. Bibl. at end of chapters.
- ROBERTSON, T. BRAILSFORD. Ueber die Verbindungen der Proteine mit anorganischen Substanzen und ihre Bedeutung für die Lebensvorgänge. *Ergeb. Physiol.* 10: 216-264 (1909). 1057 references.
- ROBERTSON, T. B. Theory of the mode of action of inorganic salts upon proteins in solution. *J. Biol. Chem.* 9: 303-326 (1911). Bibl. footnotes.
- RONA, PETER. Allgemeine Chemie der Eiweisskörper. In *Oppenheimer, Handb. Biochem.* 1: 226-273 (1909). 324 references. *Ergänzungsband*, 1913, p. 63-79. 44 footnotes.
- RONA, PETER. Eiweiss-synthese im tierischen Organismus. In *Oppenheimer, Handb. Biochem.* 4, pt. 1: 540-560 (1911). 70 footnotes.
- RONA, P., and STRAUSS, E. Methoden zur Enteiweissung von eiweiss-haltigen Flüssigkeiten. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 8: 715-730 (1922). Bibl. footnotes.
- SAMUELY, FRANZ. Einteilung und Eigenschaften der tierischen Proteine. In *Oppenheimer, Handb. Biochem.* 1: 274-346 (1909). 330 references.
- SAMUELY, FRANZ, and STRAUSS, E. Eigentliche Proteine. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 8: 461-550 (1921). Bibl. footnotes.
- SAMUELY, F., and WEIL, ARTHUR. Proteine der Tierwelt. In *Abderhal-*

den, *Biochem. Handl.* 4: 51-210 (1909); 9: 12-32 (1915). Bibl. footnotes.

SCHRYVER, S. B. The general characters of the proteins. New York, Longmans, 1909. 86 p. Bibl., p. 78-84.

SIEGFRIED, M. Die Carbamino- und Hydroxylkohlsäurereaktion. *Ergeb. Physiol.* 9: 334-335 (1908). 23 references.

STRAUSS, EDUARD, and COLLIER, WERNER A. Spezielle Chemie der Proteine (Proteine, Proteide, Protein-oide, Histone und Protamine). In *Oppenheimer, Handb. Biochem.*, 2nd ed., 625-702 (1924). 477 footnotes.

See also AMINO ACIDS, BENICE JONES PROTEIN, NITROPROTEINS, POLYPEPTIDES, ETC.

PROTEINS: Detection.

BEYER, P. E. Ueber den Nachweis von Eiweiss im Tierharn mit Merck's Tabletten. Dissertation, Bern, 1909. 39 p. 75 references.

PROTEINS: Hydrolysis and hydrolytic products.

ABDERHALDEN, EMIL. Abbau der Proteine. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 1: 596-624 (1924). 72 footnotes.

ELLINGER, ALEXANDER. Die Chemie der Eiweissfäulnis. *Ergeb. Physiol.* 6: 29-34 (1907). 149 references.

LATHROP, ELBERT C. Protein decomposition in soils. *Soil Science* 1: 529-532 (1916). 60 references.

MENDEL, A. F., and MENDEL, L. B. Some peculiarities of the proteolytic activity of papain. *J. Biol. Chem.* 8: 177-213 (1910). 50 footnotes.

"Proteolysis." *Ind.-Cat. S. G. O.*, 2nd ser., 13: 903-904 (1908).

SAMUELY, FRANZ. Intermediäre und sekundäre Abbauprodukte der Eiweisskörper. In *Oppenheimer, Handb. Biochem.* 1: 438-500 (1909). 293 footnotes.

SIEGFRIED, M. Ueber partielle Eiweiss-hydrolyse. Berlin, Borntraeger, 1916. 64 p. 267 footnotes.

STRAUSS, EDUARD. Umwandlungsprodukte der Proteine. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 8: 697-714 (1922). Bibl. footnotes.

STRAUSS, EDUARD, and COLLIER, W. A. Produkte des partiellen Abbaues der Proteine; Umwandlungsprodukte. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 1: 703-753 (1924). 315 footnotes.

See also AMINO ACIDS, POLYPEPTIDES.

PROTEINS: Metabolism.

CASPARI, W. Der Eiweissstoffwechsel. In *Oppenheimer, Handb. Biochem.*

- 4, pt. 1: 722-825 (1911). 523 footnotes.
- CASPARI, W. Der parenterale Eiweissstoffwechsel. *In* Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, p. 708-738. 136 footnotes.
- CATHCART, E. P. The physiology of protein metabolism. New York, Longmans, 1912. 142 p. Bibl., p. 123-140. 430 references.
- FÜRTH, OTTO v. Protein digestion in the stomach. *In his* Chemistry of metabolism, 1916, pt. 1-32. 93 footnotes.
- LANGSTEIN, LEO. Die Kohlenhydratbildung aus Eiweiss. *Ergeb. Physiol.* 1: 63-69 (1902); 3: 453-456 (1904). 286 references.
- LÜTHJE, HUGO. Die Eiweissregeneration im tierischem Körper. *Ergeb. Physiol.* 7: 795-797 (1908). 53 references.
- MENDEL, LAFAYETTE B. Theorien des Eiweissstoffwechsels nebst einigen praktischen Konsequenzen derselben. *Ergeb. Physiol.* 11: 419-424 (1911).
- MITCHELL, H. H. The nutritive value of proteins. *Physiol. Rev.* 4: 470-478 (1924). 150 references.
- RINGER, A. I. The proteins and their metabolism. *In* Barker, Endocrinology and metabolism, 3: 81-133; references, 5: 345-509 (1922).
- ZUNZ, EDGARD. Die Eiweissverdauung im Magen. *Ergeb. Physiol.* 5: 622-629 (1906). 167 references.
- PROTocatechuic Acid**
- DOHRN, M., and THIELE, A. Protocatechusäure. *In* Abderhalden, Biochem. Handl. 1: 1297-1299 (1911). 60 footnotes.
- PROTOPLASM**
- BROOKS, S. C. Methods of studying permeability of protoplasm to salts. *Bot. Gaz.* 64: 245-249 (1917). 70 references.
- COWDRY, E. V. Mitochondrial constituents of protoplasm. Washington, Carnegie Inst., Pub. No. 271: 39-160 (1918). Bibl. of 12 p.
- CZAPEK, F. Protoplasmastrukturen und ihre biochemische Bedeutung. *In his* Biochemie der Pflanzen, 3rd ed., 1: 50-66 (1922). Bibl. footnotes.
- FISCHER, MARTIN H., and HOOKER, MARIAN O. Ueber die Analogie des Verhaltens von Emulsionen und das Verhaltens von Fett im Protoplasma. *Kolloid-Z.* 18: 242-262 (1916). 56 footnotes.
- KANITZ, ARISTIDES. Das Protoplasma als chemische System. *In* Oppenheimer, Handb. Biochem. 2: 213-258 (1908). 208 footnotes.
- MARES, F. Der physiologische Protoplaststoffwechsel und die Purinbildung. *Arch. ges. Physiol.* 134: 59-102 (1910). Bibl. footnotes.
- RUHLAND, W. Kolloidchemische Protoplaststudien. *Kolloid-Z.* 12: 113-124 (1913). 40 references.
- SEIFRIZ, WM. Viscosity values of protoplasm as determined by microdissection. *Bot. Gaz.* 70: 360-386 (1920). 30 references.
- WEBER, FRIEDL. Die Viskosimetrie des lebenden Protoplastas. *Kolloid-Z.* 20: 169-173 (1917). 30 footnotes.
- PSEUDOCUMENE**
- BAUM, FRITZ. Pseudocumene. 1, 2, 4-Trimethylbenzol. *In* Abderhalden, Biochem. Handl. 1: 285-292 (1911). 80 footnotes.
- PTOMAINES**
- "Ptomaines." *Ind.-Cat. S. G. O.*, 1st ser., 11: 755-759 (1890); 2nd ser., 14: 46-47 (1909).
- See also* POISONS, ANIMAL.
- PULEGON**
- MEYER-JACOBSON. Pulegon. *In their* Lehrb. org. Chem. 2, pt. 1: 918-922 (1902).
- PURINES**
- BENNETT, C. B. The purines of muscle. *J. Biol. Chem.* 11: 221-234 (1912). 50 footnotes.
- BLOCH, BRUNO. Die Umwandlung der Purinkörper im Säugetierorganismus. *Biochem. Centr.* 5: 521-529, 561-569 (1906). 150 references.
- BRAHM, C. Pyrimidine und Purine. *In* Oppenheimer, Handb. Biochem., 2nd ed., 1: 267-323 (1924). 202 footnotes.
- BRAHM, CARL, and SCHMID, J. Purin-substanzen. *In* Abderhalden, Biochem. Handl. 4: 1014-1130 (1911); 9: 262-312 (1915). Bibl. footnotes.
- FÜRTH, OTTO v. Physiology and pathology of purine metabolism. *In his* Chemistry of metabolism, 1916, p. 148-193. 115 footnotes.
- HALL, I. W. The purine bodies of food stuffs. 2nd ed. Philadelphia, Blakiston, 1904. 202 p. Bibl., p. 159-180.
- MEYER-JACOBSON. Die Purin-Gruppe. *In their* Lehrb. org. Chem. 2, pt. 3: 1247-1339 (1920). Bibl. footnotes.
- "Purines." *Ind.-Cat. S. G. O.*, 2nd ser., 14: 160-161 (1909).
- TANNHAUSER, S. J. Purinsubstanzen. *In* Abderhalden, Biochem. Handl. 10: 113-155 (1923). Bibl. footnotes.
- WELLS, H. GIDEON. Purine metabolism of the monkey. *J. Biol. Chem.* 7: 171-183 (1910). 32 references.

PURPUGOGALLIN

NIERENSTEIN, M., and SPIERS, C. W. Ueber Purpugogallin. Ber. 43: 3151-3157 (1913). 41 footnotes.

See also DYES.

PUTREFACTION

"Putrefaction, chemistry and chemical tests." Ind.-Cat. S. G. O., 1st ser., 11: 891-893 (1890); 2nd ser., 14: 177-178 (1909).

PUTRESCINE. See AMINES, PTOMAINES.**PYRAMIDON**

MEYER-JACOBSON. Pyramidon. In their Lehrb. org. Chem. 2, pt. 3: 394-396 (1916). Bibl. footnotes.

"Pyramidon." Ind.-Cat. S. G. O., 2nd ser., 14: 195 (1909).

PYRAZINE

MEYER-JACOBSON. Pyrazin-Körper. In their Lehrb. org. Chem. 2, pt. 3: 1345-1368 (1920). Bibl. footnotes.

PYRAZOLE

MEYER-JACOBSON. Einkernige Pyrazol-Körper. In their Lehrb. org. Chem. 2, pt. 3: 353-438 (1915-1916).

"Pyrazole and derivatives." Ind.-Cat. S. G. O., 2nd ser., 14: 196 (1909).

PYRETHRUM POWDER. See INSECTICIDES.**PYRETICS**

LOEWI, O. Pharmakologie des Wärmehaushalts. Ergeb. Physiol. 3: 332-338 (1904). 169 references.

PYRIDAZINE

MEYER-JACOBSON. Pyridazin-Körper. In their Lehrb. org. Chem. 2, pt. 3: 1156-1171 (1920). Bibl. footnotes.

PYRIDINE

CONSTAM, E. J., and WHITE, JOHN. Physico-chemical investigations in the pyridine series. Am. Chem. J. 29: 1-49 (1903). 50 footnotes.

FEENSTRA, RUDOLF. Ueber Pyridinmetallsalze. Dissertation, Zürich, 1904. 212 references.

KAUTZSCH, KARL. Pyridin. In Abderhalden, Biochem. Handl. 1: 1419-1428 (1911). 125 references.

METZGER, SIGMUND. Pyridin, Chinolin und deren Derivate. Braunschweig, Vieweg, 1885. Bibl. p. 38-40. 136 references. Tables, giving derivatives with references, p. 42-91.

MEYER-JACOBSON. Einkernige Pyridin-Körper. In their Lehrb. Org. Chem. 2, pt. 3: 782-911 (1917).

"Pyridine." Ind.-Cat. S. G. O., 1st ser., 11: 906 (1890); 2nd ser., 14: 197 (1909).

PYRIDINE CARBOXYLIC ACIDS

MEYER-JACOBSON. Pyridincarbonsäuren. In their Lehrb. org. Chem. 2, pt. 3: 867-899 (1917). 103 references and bibl. footnotes.

PYRIMIDINES

BRAHNI, CARL, and SCHMIDT, JULIUS. Pyrimidinbasen. In Abderhalden, Biochem. Handl. 4: 1131-1150 (1911); 9: 312-322 (1915). Bibl. footnotes.

JOHNSTON, TREAT B. Pyrimidines. J. Am. Chem. Soc. 33: 764 (1911). 50 references to papers from his laboratory.

KLEINER, ISRAEL S. Physiological action of some pyrimidine compounds of the barbituric acid series. J. Biol. Chem. 11: 443-470 (1912). 35 references.

MEYER-JACOBSON. Pyrimidin-Körper. In their Lehrb. org. Chem. 2, pt. 3: 1172-1230 (1920). Bibl. footnotes.

"Pyrimidines." Ind.-Cat. S. G. O., 2nd ser., 14: 197 (1909).

THANNHAUSER, S. J. Pyrimidine. In Abderhalden, Biochem. Handl. 10: 142-155 (1923). Bibl. footnotes.

See also PURINES, NUCLEIC ACIDS, names of individual bases.

PYROCATECHOL

EINBECK, H. Brenzcatechin. In Abderhalden, Biochem. Handl. 1: 603-610 (1911). 140 footnotes (includes derivatives).

MEYER-JACOBSON. Brenzcatechin. In their Lehrb. org. Chem. 2, pt. 1: 410-413 (1896). Bibl. footnotes.

PYROGALLOL

EINBECK, H. Pyrogallol. In Abderhalden, Biochem. Handl. 1: 667-674 (1911). 120 footnotes (includes derivatives).

MEYER-JACOBSON. Pyrogallol. In their Lehrb. org. Chem. 2, pt. 2: 423-424 (1896). Bibl. footnotes.

PYROGENESIS

DUNSTAN, A. E., and THOLE, F. B. Chronological index of the literature on pyrogenesis. J. Inst. Petroleum Tech. 3: 90-96 (1916); J. Ind. Eng. Chem. 9: 890-895 (1917). 137 patents and 153 references.

PYRONES

MEYER-JACOBSON. Pyrone. In their Lehrb. org. Chem. 2, pt. 3: 696-719 (1916). Bibl. footnotes.

PYROPHOSPHORIC ACID

GUTBIER, A. Pyrophosphorsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 173-178 (1911). References through text.

PYROSULFURYL CHLORIDE

SANGER, CHARLES R., and RIEGEL, EMILE R. Pyrosulfurylchloride und Chlorsulfonsäure. Z. anorg. Chem. 76: 126-128 (1912). 60 references.

PYROTECHNICS

BROCK, ALAN ST. H. Pyrotechnics; the history and art of fireworks mak-

ing. London, O'Connor, 1922. 197 p. Bibl., p. 182-185.

OELKER, A. [Collective table of domestic and foreign patents on light rockets, signal cartridges, etc.] *Z. ges. Schiess-Sprengstoffw.* 11: 166-167, 185-188 (1916).

See also EXPLOSIVES.

PYROXYLIN

WORDEN, E. C. Pyroxylin plastics, celluloid substitutes, etc. *In his Technology of cellulose esters* 1: 2655-2779 (1921). Bibl. footnotes.

See also CELLULOID, LACQUERS, PLASTICS.

PYRROLE

KAUTZSCH, KARL. Pyrrol. *In Abderhalden, Biochem. Handl.* 1: 1379-1392 (1911). 85 references.

KÜSTER, WM. Pyrrolerivate. *In Abderhalden, Biochem. Handl.* 10: 39-95 (1923). Bibl. footnotes.

MEYER-JACOBSON. Einkernige Pyrrol-Körper. *In their Lehrb. org. Chem.* 2, pt. 3: 146-205 (1915). Bibl. footnotes.

PYRROLIDINE

KAUTZSCH, K. Pyrrolidin. *In Abderhalden, Biochem. Handl.* 1: 1406-1414 (1911). Bibl. footnotes.

PYRROLINE

KAUTZSCH, KARL. Pyrrolin. *In Abderhalden, Biochem. Handl.* 1: 1401-1406 (1911). Bibl. footnotes.

PYRUVIC ACID

MEYER-JACOBSON. Brenztraubensäure. *In their Lehrb. org. Chem.* 1, pt. 2: 1116-1122 (1913). Bibl. footnotes.

"Pyruvic acid." *Ind.-Cat. S. G. O.*, 3rd ser., 1: 125 (1918).

THIELE, A. Brenztraubensäure. Pyruvinsäure. *In Abderhalden, Biochem. Handl.* 1: 1085-1088 (1911). 75 footnotes.

QUARTZ

DOELTER, C. Quarz (SiO_2). *In Doelter, Handb. Mineralchem.* 2, pt. 1: 118-157 (1914). Bibl. footnotes.

GROSSMANN, H. Quarz. *In Abegg, Handb. anorg. Chem.* 3, pt. 2: 368-370 (1909).

JACOBY, R. Quarz. *In Gmelin-Kraut, Handb. anorg. Chem.* 3, pt. 1: 131-136 (1912).

See also SILICA, SILICON.

QUERCETIN

MEYER-JACOBSON. Quercetin. *In their Lehrb. org. Chem.* 2, pt. 3: 749-750 (1917). Bibl. footnotes.

RÜPE, H., and ALTENBURG, H. Quercetin. *In Abderhalden, Biochem. Handl.* 6: 32-35 (1911). 40 references.

See also PLANT PIGMENTS.

QUINAZOLINE

BOGERT, MARSTON T. Review of some recent investigations in the quinazoline group. *J. Am. Chem. Soc.* 32: 784-795 (1910). 60 footnotes and list of 28 papers from his laboratory.

MEYER-JACOBSON. Chinazolin-Körper. *In their Lehrb. org. Chem.* 2, pt. 3: 1231-1243 (1920). Bibl. footnotes.

QUINIC ACID

DOHRN, M., and THIELE, A. Chinasäure. *In Abderhalden, Biochem. Handl.* 1: 1309-1311 (1911). 50 footnotes.

QUININE

BERGER, HERMANN. Das Chinin. *Z. Chemotherap.* 2: 613-630 (1913).

KOENIGS, WILHELM. Ueber das Merochinen und ueber die Konstitution der Chinaalkaloide. *Ann.* 347: 143-232 (1906). 127 footnotes.

LAQUEUR, ERNST. Die neueren Chemotherapeutischen Präparate aus der Chininreihe und aus der Akridinreihe. *Ergeb. inneren Medizin* 23: 469-474 (1923).

MURRAY, BENJAMIN L. The constitution of quinine. *School Mines Quart.* 27: 57-60 (1905). 68 references, 1820-1902.

"Quinine." *Ind.-Cat. S. G. O.*, 1st ser., 11: 953-967 (1890); 2nd ser., 14: 226-234 (1909).

RABE, PAUL. Zur Kenntniss der Chinaalkaloide. *Ann.* 350: 180-203 (1906). 45 footnotes.

SCHMIDT, JULIUS. Alkaloide der Chinolingruppe. *In Abderhalden, Biochem. Handl.* 5: 120-190 (1911). Bibl. footnotes.

See also ALKALOIDS.

QUININE TANNATE

PUCHNER, W. A., and WARREN, L. E. Preparation, quality and testing of quinine tannate. *J. Am. Pharm. Assoc.* 1: 587-590 (1912). Annotated, 1827-1911.

QUINOLINE

KAUTZSCH, KARL. Chinolin. *In Abderhalden, Biochem. Handl.* 1: 1465-1476 (1911). 125 footnotes.

MEYER-JACOBSON. Die Chinolin-Gruppe. *In their Lehrb. org. Chem.* 2, pt. 3: 912-1013 (1918). Bibl. footnotes.

"Quinoline." *Ind.-Cat. S. G. O.*, 1st ser., 11: 967 (1890); 2nd ser., 14: 235 (1909).

QUINONE

EINBECK, H. Chinon. *In Abderhalden, Biochem. Handl.* 1: 634-639 (1911). 100 references (includes derivatives).

QUINONE—Cont'd

MEYER-JACOBSON. Chinone. *In their* Lehrb. org. Chem. 2, pt. 1: 438-447 (1896). Bibl. footnotes.

SCHMIDT, JULIUS. Über Chinone und chinoide Verbindungen. *Sammlung chem. chem.-tech. Vorträge* 11: 434-440 (1907).

WITTE, E. Chinone. *In* Abderhalden, Biochem. Handl. 1: 904-911 (1911). About 200 footnotes.

QUINONIMID DYES

KEHRMANN, F. Ueber die Natur der ringförmige Chinonimidfarbstoffe. *Ann.* 414: 131-188 (1917). Bibl. footnotes.

See also DYES.

QUINOPHTHALON

EIBNER, A., and LANGE, O. Zur Constitution der Chinophthalons und der beiden isomeren Chinophthaline. *Ann.* 315: 303-356 (1900). 90 footnotes.

QUINOSOL

"Quinosol." *Ind.-Cat. S. G. O.*, 2nd ser., 14: 235 (1909).

RACEMIC COMPOUNDS

BYK, A. Zur Frage der Spaltbarkeit von Razemverbindungen durch zirkulärpolarisiertes Licht, ein Beitrag zur primären Entstehung optisch-aktiver Substanzen. *Z. physik. Chem.* 49: 641-687 (1904). Bibl. footnotes.

GADAMER, J. Ueber die Racemisation der Tropasäure und ihrer Ester; zugleich eine Theorie der Racemisation, Substitution und Waldenschen Umkehrung. *J. prakt. Chem.* 195: 312-392 (1913). Bibl. footnotes.

LADENBURG, A. Ueber Racemie. *Sammlung chem. chem.-tech. Vorträge* 8: 449-465 (1903). Bibl. footnotes.

WINTHER, CHR. Studien ueber katalytische Razemisierung. *Z. physik. Chem.* 56: 465-511, 703-718 (1906). Bibl., p. 466-468.

RADICALS

GOMBERG, M. The existence of free radicals. *J. Am. Chem. Soc.* 36: 1144-1170 (1914). Bibl. footnotes.

LECHER, HANS. Die Radikale in der älteren und in der modernen organischen Chemie. *Naturwissenschaften* 9: 565-566 (1921). 55 references.

LIPP, P. Freie organische Radikale. *Jahrb. Radioakt. Elektronik* 12: 35-74 (1915). Bibl. footnotes.

SCHMIDLIN, JULIUS. Das Triphenylmethyl. Stuttgart, Enke, 1914. 233 p. Bibl. footnotes.

WALDEN, P. Ueber freie Radikale. *Rec. trav. chim.* 41: 530-556 (1922). Bibl. footnotes.

RADIUM AND RADIOACTIVITY

BARKER, GEORGE F. Radioactivity and chemistry. *School Mines Quar.* 24: 296-302 (1903). 160 references.

BARKER, HOWARD H. Experiments on the extraction and recovery of radium from typical American carnotite ores, including contributions to methods of measuring radium. *Univ. Mo. Bull.* 24, No. 26: 75-77 (1923). *Univ. Mo. Eng. Expt. Sta.*, Ser. No. 23.

BLANC, G. A. Die radioaktiven Stoffe in der Erdatmosphäre. *Jahrb. Radioakt. Elektronik* 6: 502-571 (1909). Bibl. footnotes.

BORNE, GEORG V. D. Die Radioaktiven Mineralien, Gesteine und Quellen. *Jahrb. Radioakt. Elektronik* 2: 77-79 (1905). 103 references.

CAMERON, A. T. Radiochemistry. London, Dent, 1910. 174 p. 100 references.

CAMPBELL, NORMAN R. Die Radioaktivität als allgemeine Eigenschaft der chemischen Elemente. *Jahrb. Radioakt. Elektronik* 2: 434-462 (1906). Bibl. footnotes.

CHEMICAL SOCIETY. Radioactivity. *In* Annual reports on the progress of chemistry. 1+. 1904 to date. Bibl. footnotes. Chapter missing in some volumes.

CURIE, P. Recent researches in radioactivity. *Am. Chem. J.* 31: 443-445 (1904). Classified list of references up to 1903.

CURIE, S. Untersuchungen ueber die radioaktiven Substanzen. Braunschweig, Vieweg, 1904. Covers the work up to 1903.

EBLER, E., and BENDER, W. Neue Methoden zur Gewinnung des Radiums aus Uranerzen. *Z. angew. Chem.* 28: 25-48 (1915). 139 footnotes.

ELSTER, J., and GEITEL, H. Die Radioaktivität des Kaliums und Rubidiums. *Jahrb. Radioakt. Elektronik* 10: 323-339 (1913). 23 references.

FAJANS, K. Radioactivity and the latest developments in the study of the chemical elements. Translated from 4th German ed. London, Methuen, 1923. 138 p. Bibl., p. 121-129.

FLECK, ALEX. The chemistry of the radioclements. *J. Röntgen Soc.* 11: 53-69 (1915).

GAGER, CHARLES S. Discovery and nature of radioactivity. *In* Mem. N. Y. Bot. Garden, 4: 14-21 (1908). 149 references.

GEITEL, H. Die Radioaktivität der Erde und der Atmosphäre. *In* Marx,

- Handbuch der Radiologie, 1: 401-458 (1920). Bibl. footnotes.
- GOCKEL, A. Die Radioaktivität von Boden und Quellen. Braunschweig, Vieweg, 1914. 108 p.
- GRUNER, P. Die Fortschritte der Radioaktivität, 1908-1909. *Ion* 2: 67-71 (1910). 80 references.
- HALEN, S. Die neuesten Forschungen auf dem Gebiete des Radiums und seiner Emanation. *Erdel-Erden u. -Erze*, 2: 74-76 (1921). References through text.
- HEINRICH, FERD. Neuere Forschungen auf dem Gebiete der Radioaktivität. *Z. angew. Chem.* 22: 385-391 (1909); 27 footnotes. 23: 769-777 (1910); 42 footnotes. 24: 1011-1020 (1911); 31 footnotes. 26: 289-303 (1913); 108 footnotes. 28: 287-291, 297-303, 305-308, 313-315 (1915); 93 footnotes. 30: 57-64, 65-70, 78-80 (1917); 77 footnotes.
- HESS, V. F. Radioaktivität. *Fortschritte Chem.* 1: 7-14, 227-236 (1909); 2: 59-73 (1910); 3: 9-23, 297-320 (1910-1911); 4: 238-254 (1911); 5: 101-113, 157-174 (1912); 7: 153-194 (1913); 9: 141-150 (1914); 11: 33-43, 65-76 (1915-1916); 13: 143-174 (1917-1918); 15: 1-22 (1919-1920). References through text.
- HEVESY, G. v. Die Eigenschaften der Emanationen. *Jahrb. Radioakt. Elektronik* 10: 198-199 (1913). About 60 references.
- HEVESY, GEORGE v., and PANETH, F. *Lehrbuch der Radioaktivität*. Leipzig, Barth, 1923. 213 p. Bibl., p. 201-207, covers 1916-1923.
- IKLE, M. Literatur der Radioaktivität vor dem Jahre 1904. *Jahrb. Radioakt. Elektronik* 1: 413-442 (1904). Chronological.
- KAUSCH, —. Die patentierten Verfahren zur Gewinnung radioaktiver Stoffe. *Edel-Erden u. -Erze* 1: 37-40, 53-55, 66-68 (1919). Patents through text.
- LACHS, HILARY. Ueber den kolloiden Zustand der radioaktiven Stoffe. *Kolloid-Z.* 21: 165-176 (1917). 48 footnotes.
- LIND, SAMUEL C. The chemical effects of α -particles and electrons. New York, Chem. Cat. Co., 1921. 182 p. Bibl. footnotes.
- LUCAS, RICHARD. Bibliographie der radioaktiven Stoffe. Hamburg, Voss, 1908. 98 p. About 1300 references.
- LUCAS, RICHARD. Radioaktive Stoffe. *In Gmelin-Kraut, Handb. anorg. Chem.* 3, pt. 2: 1-53 (1908). Radium, p. 17-35.
- MARCKWALD, W. Radioactivity. *Ber.* 41: 1524 (1908); *Am. Chem. J.* 41: 515-557 (1909). Bibl. footnotes.
- MELLOR, J. W. Radium and radioactivity. *In his Inorg. theor. chem.* 4: 53-154 (1923). Bibl. through chapter.
- MEYER, STEFAN. Mitteilungen aus dem Institut für Radiumforschung, 1911-1920. *Jahrb. Radioakt. Elektronik* 17: 23-29 (1920). 133 references.
- MEYER, ST., and SCHWEIDLER, E. v. Bericht ueber die Endglieder der Radiumzerfallsreihe (Radioblei). *Jahrb. Radioakt. Elektronik* 3: 381-384 (1907). 77 references.
- MEYER, ST., and SCHWEIDLER, E. v. Radioaktivität. Leipzig, 1916. 541 p. "Radioactivity." *Ind.-Cat. S. G. O.*, 2nd ser., 14: 251-259 (1909).
- RAMSAY, WM., and RUDOLF, GEORGE. Die radioaktiven Emanationen. *In their Die Edelgase*, p. 305-312, 358-362 (1918).
- RANDALL, MERLE. The Boltwood standard of radioactivity. *Trans. Am. Electrochem. Soc.* 21: 463-497 (1912). 69 references.
- RIGHI, AUGUSTO. La moderna teoria dei fenomeni fisici (radioattività, ioni, elettroni). 2nd ed. Bologna, 1904. 165 p. Bibl., p. 159-165.
- RUSSELL, ALEXANDER S. An introduction to the chemistry of radioactive substances. London, Murray, 1922. 173 p. Bibl., p. vi-vii.
- RUTHERFORD, E. Radioaktive Substanzen und ihre Strahlungen. Vol. 2 of Marx, *Handbuch der Radiologie*. 1913. 642 p. Bibl. footnotes.
- SCHMIDT, HEINRICH W. Bericht ueber die Anfangsglieder der Radiumzerfallsreihe. *Jahrb. Radioakt. Elektronik* 4: 195-197 (1908). 54 references.
- SODDY, FREDERICK. Chemistry of the radio-elements. New York, Longmans, 1911-1914. 138 p. 121 references.
- TABLES ANNUELLES. Radioactivité. 1: 265-269 (1911); 2: 401-409 (1910); 3: 299-302 (1911); 4: 698-705 (1913-1916). References to all quantitative numerical data.
- WENDT, G. L. The constants of radioactivity. *Phys. Rev.* (2) 7: 389-393 (1916). 38 footnotes, covering 1911-1915.
- RADIUM: Analysis.**
- LIND, S. C. "Analytical methods for radium." *U. S. Bur. Mines, Bull.* No. 212: 197-198 (1923). 22 references.

RADIUM: Biological action.

AMERICAN INSTITUTE OF MEDICINE. Bibliography on radium; its uses and results from its discovery up to January, 1922. New York, Adams and Grace, 1922. 132 p.

AMERICAN INSTITUTE OF MEDICINE. Radium; abstracts of selected articles on radium and radium therapy. New York, Adams and Grace, 1922. 164 p.

GAGER, CHARLES S. The effect of the rays of radium on plants. Mem. N. Y. Botanical Garden, vol. 4, 1908. 278 p. Bibl. through text. About 300 references.

"Index of articles relating to the therapeutic use of radium and radioactive substances which appeared in 1923-1924." Radium 3: 67-95 (1924); 3rd ser., no. 1: 33-64 (1925).

KÖRÖSY, KORNEL V. Radioaktivität und Fermentwirkung. Arch. ges. Physiol. 137: 123-143 (1911). Bibl. footnotes.

KRAMER, JOHN B. Radiations from slow-radium, with a note on their therapeutic value, by John Hall-Edwards. London, Bailliere, 1921. 105 p. Bibl. footnotes.

LAZARUS, PAUL. Handbuch der Radium-biologie und Therapie, einschliesslich der anderen radioaktiven Elemente. Wiesbaden, Bergmann, 1913. 521 p. Bibl., p. 485-513. About 1000 references.

LOEB, LEO. Effects of Roentgen rays and radioactive substances on living cells and tissues. J. Cancer Research 7: 229-282 (1922).

LOEWENTHAL, SIEGFRIED. Grundriss der Radiumtherapie und der biologischen Radiumforschung. Wiesbaden, Bergmann, 1912. 255 p. Bibl., p. 225-251.

LONDON, E. S. Das Radium in der Biologie und Medizin. Leipzig, Akadem. Verlags., 1911. 199 p. Bibl., p. 179-199.

PLESCH, J. Die Biochemie der radioaktiven Substanzen. In Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, p. 537-568. 93 footnotes.

SIMPSON, FRANK E. Radium therapy. St. Louis, Mosby, 1922. 391 p. Bibl., p. 325-383.

SUGIURA, K., and BENEDICT, S. R. Action of radium emanation on the vitamins of yeast. J. Biol. Chem. 39: 421 (1919). 40 references.

RADIUM BROMIDE

"Radium bromide." Ind.-Cat. S. G. O., 2nd ser., 14: 255-256 (1909).

See also RADIUM.

RAFFINOSE

HARDING, T. SWANN. History of raffinose, its discovery and methods of preparation. Sugar 25: 310 (1923). 40 references.

KURIYAMA, S., and MENDEL, L. B. Physiological behavior of raffinose. J. Biol. Chem. 31: 125 (1917). 51 references.

LIPPMANN, E. O. v. Raffinose. In his Chemie der Zuckerarten, 2: 1623-1664 (1895). Bibl. through text.

MEYER-JACOBSON. Raffinose. In their Lehrb. org. Chem. 1, pt. 2: 1019-1021 (1913). Bibl. footnotes.

NEUBERG, C., and REWALD, B. Raffinose (Melitriose). In Abderhalden, Biochem. Handl. 2: 430-434 (1911); 8: 227-229 (1914). About 130 footnotes.

ZEMPLÉN, GÉZA. Raffinose. In Abderhalden, Biochem. Handl. 10: 628-631 (1923). Bibl. footnotes.

See also CARBOHYDRATES.

RARE EARTHS

BÖHM, C. RICHARD. Die Darstellung der seltenen Erden. Leipzig, Veit, 1905. 2 vols. Bibl. footnotes.

BÖHM, C. RICHARD. Die Dissertationen ueber seltene Erden. Charlottenburg, Heydenreich, 1912. 16 p. Also in Z. angew. Chem. 25: 758-761 (1912); 28: 356 (1915). 149 references, 1856-1912. Chronological.

BÖHM, C. RICHARD. Das Gasgluehlicht, seine Geschichte, Herstellung und Anwendung. Leipzig, 1905. Bibl., p. 459-514.

BROWNING, PHILIP E. Introduction to the rarer elements. New York, Wiley, 1917. 250 p. Bibl. footnotes.

CLEVE, P. T. Bibliographie, comprenant le cérium, le lanthane et le didyme. In Frémy, Enc. chim. 3, 5^e cahier: p. 140-144 (1884). References to other rare earths in same volume.

HALEN, S. Neueste Arbeiten betreffend der Platinbegleitmetalle, Iridium, Palladium Osmium, Rhodium and Ruthenium, sowie deren Verbindungen. Edel-Erden u. -Erze 2: 145-146, 156-157 (1921). References through text.

JOHNSTONE, SYDNEY J. The rare earth industry. New York, Appleton, 1915. 136 p. Bibl. and patents at beginning of each chapter.

LITTLE, H. F. V. The rare earth elements. In Friend, Textbook, 4: 216-440 (1917). Bibl. footnotes.

MELLOR, J. W. The rare earths. In his Inorg. theor. chem. 5: 494-710 (1924). References through chapter.

MEYER, R. J. Bibliographie der seltenen Erden. Hamburg, Voss, 1905.

- 79 p. *Also in* Z. anorg. Chem. 43: 416-492 (1905). 777 references, chronologically arranged, covering 1751 to 1905, with author and subject index. *See also* Abegg, Handb. anorg. Chem. 3, pt. 1: 342-358 (1906), where 725 references are given.
- SCHILLING, JOHANNES. Das Vorkommen der "seltenen Erden" im Mineralreiche. München, 1904. 115 p. Bibl. through text under names of the minerals.
- SPENCER, J. F. The metals of the rare earths. London, Longmans, 1919. 279 p. Bibl. p. 241-262. 1029 references with author index.
- STERN, E. Gasbeleuchtungswesen und seltene Erden. Fortschritte Chem. 2: 139-146 (1910); 3: 233-238 (1910-1911); 5: 263-269 (1912). References through text.
- URBAIN, G. Terres rares. *In* Moissan, Chim. min. 3: 770-860 (1904). 875 footnotes.
- RARE EARTHS: Analysis.**
- MEYER, R. J., and HAUSER, O. Die Analyse der seltenen Erden und der Erdsäuren. Stuttgart, Enke, 1912. 320 p. Bibl. footnotes.
- SCHOELLER, W. R., and POWELL, A. R. Analysis of minerals and ores of the rarer elements. London, Griffin, 1919. 239 p. Bibl. footnotes.
- RARE GASES**
- HÉBERT, A. Gaz de l'air. *In* Moissan, Chim. min. 1: 686-690 (1904). 61 footnotes.
- PRANDTL, W. Helium, Argon, Neon, Krypton und Xenon. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 149-167 (1907). References through text.
- RAMSAY, WM., and RUDORF, GEORGE. Die Edelgase. Leipzig, Akad. Verlags, 1918. 416 p. Bibl. p. 3-4, 286-299.
- See also* names of the individual gases.
- RASPBERRY JUICE**
- BUTTENBERG, P. Die Untersuchung und Beurteilung des Himbeersafte und Himbeersirupes. Arch. Pharm. 245: 81-97 (1907). Bibl. footnotes.
- See also* FRUIT JUICES.
- REACTION PRESSURE**
- LANDOLT-BÖRNSTEIN. Zersetzungsdrucke. *In their* Tabellen, 5th ed., 1923, p. 1412-1416.
- REACTION VELOCITY**
- HERZFELD, KARL F. Zur Theorie der Reaktionsgeschwindigkeiten in Gasen. Ann. Physik (4) 59: 635-667 (1919). Bibl. footnotes.
- ROWE, ALLAM W. Die Geschwindigkeit der Knallgasreaktion. Z. physik. Chem. 59: 41-71 (1907). 57 footnotes.
- TRAUTZ, MAX. Der Temperaturkoeffizient chemischer Reaktionsgeschwindigkeiten. Z. physik. Chem. 65: 53-88 (1908); 69: 496-511 (1909). About 100 references.
- TRAUTZ, MAX. Reaktionsgeschwindigkeit und Katalyse. Z. Elektrochem. 18: 908-919 (1912); 19: 133-151 (1913). Bibl. footnotes.
- TUBANDT, C. Zur Kenntniss der Reaktionskinetik in nichtwässrigen Lösungen. Ann. 354: 259-324 (1907). 60 footnotes.
- See also* CHEMICAL KINETICS.
- REDMANOL.** *See* PLASTICS.
- REFRACTIVE INDEX**
- CHÉNEVEAU, C. Sur les propriétés optiques des solutions et des corps dissous. Ann. chim. phys. (8) 12: 384-393 (1907). 146 references.
- CHÉNEVEAU, C. Les propriétés optiques des solutions. Paris, Gauthier, 1913. 240 p. Bibl., p. 225-236.
- KANTHACK, R. Table of refractive indices. I. Essential oils. New York, Van Nostrand; London, Hilger, 1918. 148 p. Bibl. of 282 references, p. 8-16C. 500 oils are listed with references to the bibl.
- KANTHACK, R. Tables of refractive indices. II. Oils, fats and waxes. London, Hilger, 1921. 295 p. Bibl. of 478 references, p. 7-26. Author index with alphabetical index of materials.
- LANDOLT-BÖRNSTEIN. Literatur, betreffend Brechungsindizes ausgewählter Krystalle und deren Änderung mit der Temperatur. *In their* Tabellen, 4th ed., 1912, p. 977-978; 5th ed., 1923, p. 920-922.
- LANDOLT-BÖRNSTEIN. Literatur, betreffend Brechungsexponenten. *In their* Tabellen, 4th ed., 1912, p. 1010-1012, 1016, 1020, 1037, 1051; 5th ed., 1923, p. 952-955, 958-959, 964-965, 967, 982, 983, 984, 998. Covers various classes of substances.
- RIMBACH, E. Beziehungen zwischen Lichtbrechung und chemischer Zusammensetzung der Körper. *In* Graham-Otto, Lehrb. der Chemie 1, pt. 3: 567-665 (1898).
- SPANGENBERG, K. Die Einbettungsmethode. Fortschr. Mineral. Krist. Petr. 7: 61-64 (1922). 75 references.
- REFRACTOMETERS**
- ZEISS, CARL. Literatur über die Anwendung unserer technischen Refraktometer. Jena, Zeiss, 1905. 373 references. Supplementary references in Mess. Leaflet No. 178, 1907.

REFRACTORIES

- AMERICAN CERAMIC SOCIETY. Bibliography of magnesite refractories. Columbus, Ohio, Am. Ceram. Soc., 1924. 41 p. Chronological, 1873-1921. Brief annotations.
- AMERICAN CERAMIC SOCIETY. Bibliography of silica refractories. Columbus, Ohio, Am. Ceram. Soc., 1924. 125 p.
- AMERICAN GAS INSTITUTE. Bibliography of articles on refractory materials. New York, Am. Gas Inst., 1915. 104 p. Subject index.
- ANDERSEN, OLAF. [Physical chemistry of refractory oxides.] Norg. Geol. Undersökelse, Statens Raastofkomite Pub. No. 1, 1922. 55 p.
- BLEININGER, A. V., and BROWN, G. H. Testing of clay refractories, with special reference to their load carrying capacity at furnace temperatures. U. S. Bur. Standards, Tech. Paper No. 7, 1911. About 60 footnotes.
- CELLERIER, —. Résumé des travaux sur la fabrication des briques de silice. Paris, 1919.
- CRONSHAW, H. B. Deterioration of refractory materials in the iron and steel industries, Trans. Faraday Soc. 12: 247-249 (1917). 50 references.
- GILARD, P. Sur la conductibilité thermique des matériaux réfractaires. Rev. universelle mines (7) 4:50 (1924). 38 references.
- HADFIELD, R. Refractories. Trans. Faraday Soc. 12: 98-108 (1916). About 55 books and 80 articles listed.
- HEMMING, EMILE. Ceramic products. In his Plastics and molded electrical insulation, 1923, p. 17-29. Patents only.
- HOFMAN, H. O. Refractory materials. In his General metallurgy, 1913, p. 341-378. Bibl. footnotes.
- HOUGEN, O. A. Refractories for industrial plant use. Chem. Met. Eng. 30: 741 (1924). 97 references.
- HOWE, R. M. Testing of refractories. J. Am. Ceram. Soc. 6: 296-298 (1923). 18 references.
- MCDOWELL, J. SPOTT, and HOWE, R. M. Magnesite refractories. J. Am. Ceram. Soc. 3: 237-246 (1920). Select bibl. of magnesite and magnesite brick.
- MCDOWELL, J. SPOTT, and ROBERTSON, H. S. Chrome refractories. J. Am. Ceram. Soc. 5: 865-887 (1922). 130 references, p. 882-887.
- MOTT, WM. ROY. Relative volatilities of refractory materials. Trans. Am.

Electrochem. Soc. 34: 282-285 (1918). 18 references.

- NATIONAL RESEARCH COUNCIL. Engineering division. Summary of published material on refractories (other than manufactured ware) used in foundries. New York, 1921. 82 p., mimeographed. Contains bibls.
- NORTON Co. Some references concerning alundum and crystolon. In their Refractories, Worcester, Mass., n. d. Bibl., p. 53-55.
- SOCIETY OF CHEMICAL INDUSTRY. Refractories. In Reports on the progress of applied chemistry, 2: 204-241 (1917); 3: 184-208 (1918); 4: 178-188 (1919); 5: 203-215 (1920); 6: 211-227 (1921). Bibl. footnotes. In later volumes, combined with ceramics.
- WATTS, A. S., and KING, R. M. The transfer of heat through refractories and its determination. J. Am. Ceram. Soc. 6: 1075-1089 (1923). Bibl. footnotes and bibl. of 31 references, p. 1088-1089.

See also CERAMICS, SILICA.

REFRIGERATION

- AMERICAN ASSOCIATION OF ICE AND REFRIGERATION. Committee on papers and lectures. Bibliography of American literature relating to refrigeration, with synopsis of papers and reports covering the year 1915-—. Compiled under the direction of the Committee on papers and lectures of the American association of ice and refrigeration. Chicago, Ill., The Association 1920-—. 1915 is 2nd edition; 1st edition (56 p.) has date, 1916. Since 1916, each volume covers two years, each with special t.-p. and index, but paged continuously.
- FERRETTI, UBERTO. L'industria del freddo e sue applicazioni all'igiene, all'agricoltura, al commercio, ecc. Rocca San Casciano, Cappelli, 1909. 445 p. Bibl., p. 437-442.
- GT. BRIT. Department of scientific and industrial research. Food investigation board. The literature of refrigeration. By G. C. Hodsdon and C. H. Lees. Special report No. 2, 1919. 8 p. 170 references.
- KANOLT, C. W. The production of cold. J. Optical Soc. Am. 9: 411-454 (1924). Bibl. footnotes.
- WALLIS-TAYLER, ALEXANDER J. Refrigeration, cold storage and ice-making; a practical treatise on the art and science of refrigeration. 6th ed. London, Lockwood, 1920. 662 p. Bibl., p. 622-624.

Serial

Monthly bulletin of information on refrigeration. 1920-. Classified under: Scientific questions, refrigerating materials, general applications of refrigeration, refrigerated transport.

RENNET

"Rennet." Ind.-Cat. S. G. O., 1st ser., 12: 39 (1891); 2nd ser., 14: 438 (1909).

See also ENZYMES.

RESEARCH

FLEMING, A. P. M., and PEARCE, J. G. Research in industry. London, Pitman, 1922. 244 p. Bibl., p. 221-236. Classified.

MEES, C. E. KENNETH. Organization of industrial scientific research. New York, McGraw, 1920. 175 p. Bibl., p. 156-167.

WEST, CLARENCE J. A reading list on scientific and industrial research and the service of the chemist to industry. Reprint and Circular Ser., National Research Council, No. 9, 1920. 45 p. In part in Special Libraries, Jan., 1920, and Bibliographic Series, A. D. Little, Inc., Cambridge, Mass., No. 3. 10 p. 1920.

RESIN ALCOHOLS

PINCUSOHN, LUDWIG. Harzalkohol. In Abderhalden, Biochem. Handl. 7: 727 (1912). 60 footnotes.

RESINS

AUSTERWELL, GÉZA, and ROTH, J. Gewinnung und Verarbeitung von Harz und Harzprodukten. Berlin, Oldenbourg, 1917. 180 p. Bibl., p. 7-8.

BRUHN, BRUNO. Ueber Harzsäure, Harzessenz und Harzöl. Chem.-Ztg. 24: 1105-1108 (1900). 30 footnotes.

DIETERICH, CARL. The analysis of resins with a bibliography. 2nd ed. New York, Van Nostrand, 1920. 447 p.

DIETERICH, KARL. Harze. In Abderhalden, Biochem. Handl. 7: 682-726 (1912). About 200 footnotes.

DOHRN, M., and THIELE, ALBRECHT. Harzsäuren. In Abderhalden, Biochem. Handl. 7: 747-776 (1912). About 135 footnotes.

DUPONT, G. Les constituants acides des résines confifères. Bull. soc. chim. (4) 35: 1263-1270 (1924). 147 references.

HAWKES, EMMA B. Gums, resins and extracts. In Catalog of publications relating to forestry, U. S. Dept. Agr., Library Bull., No. 76, p. 237-243 (1912).

HOLDT, P. C., GARDNER, H. A., and JAMESON, P. E. Bibliography of

varnish resins. Paint Mfrg. Assoc. U. S., Sci. Sect., Circ. No. 159, 1922. Bibl., p. 94-95. 100 references.

MEYER-JACOBSON. Sauerstoffhaltige Bestandteile von Harzen und Milchsaften. In their Lehrb. org. Chem. 2, pt. 4: 125-180 (1924). Bibl. footnotes.

RICHTER, PAUL. Zur Kenntniss des Guajakharzes. Arch. Pharm. 244: 90-119 (1906). Bibl. footnotes.

SCHALL, MAX. Harze. Kunststoffe 2: 45-48, 71-74, 93-96 (1912). Patents.

SOANE, C. E. The chemistry of rosin and rosin oil. J. Oil Color Chem. Assoc. 5: 320-347 (1922).

TSCHIRCH, A. Die Harze und die Harzbehälter. Leipzig, Bornträger, 1906. 1092 p. Bibl. footnotes.

See also ABIETIC ACID, BALSAMS, GUMS, PLASTICS.

RESORCINOL

EINBECK, H. Resorcin. In Abderhalden, Biochem. Handl. 1: 617-626 (1911). 170 footnotes.

MEYER-JACOBSON. Resorcin. In their Lehrb. org. Chem. 2, pt. 1: 413-420 (1896). Bibl. footnotes.

"Resorcin." Ind.-Cat. S. G. O., 1st ser., 12: 49-50 (1891); 2nd ser., 14: 449 (1909).

RESPIRATION

BACH, A. Oxydationsprozesse in der lebenden Substanz. In Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, p. 133-182. 100 footnotes.

BILLINGS, JOHN S., MITCHELL, S. W., and BERGEY, D. H. The composition of expired air and its effect upon animal life. Smithsonian Inst. Pub. No. 989, 1895. 81 p. Bibl., p. 29-31.

CROZIER, W. J. On biological oxidations as function of temperature. J. Gen. Physiol. 7: 214-216 (1924). 80 references.

JAQUET, A. Der respiratorische Gaswechsel. Ergeb. Physiol. 2: 456-573 (1903). 246 references through text.

KROGH, AUGUST. The respiratory exchange of animals and man. New York, Longmans, 1916. 173 p. Bibl., p. 151-168. Classified.

LOEWY, A. Der Respiratorische- und der Gesamtumsatz. In Oppenheimer, Handb. Biochem. 4, pt. 1: 133-284 (1911). 396 footnotes.

LOEWY, A. Die Gase des Körpers und der Gaswechsel. I. Die Gase des Körpers. II. Die Wanderung der Gase im Körper. Die Respiratorische- und Gesamtumsatz. In Oppenheimer, Handb. Biochem., 2nd ed., 6: 1-278 (1923). 936 footnotes.

LOEWY, A. Der Gaswechsel der Organe und Gewebe. In Oppenheimer,

RESPIRATION—Cont'd

Handb. Biochem., 2nd ed., 8: 1-30 (1923). 90 footnotes.

MEYERHOF, OTTO. Chemical dynamics of life phenomena. Philadelphia, Lippincott, 1924. 110 p. Bibl., p. 101-108. 163 references.

"Respiration, chemistry of." Ind.-Cat. S. G. O., 1st ser., 12: 56-58 (1891); 2nd ser., 14: 452-454 (1909).

WARBURG, OTTO. Beiträge zur Physiologie der Zelle, insbesondere ueber die Oxydationsgeschwindigkeit in Zellen. *Ergeb. Physiol.* 14: 253-337 (1914). 123 references.

See also METABOLISM.

RHAMNOSE

HARDING, T. SWANN. History of rhamnose, its discovery and methods of preparation. *Sugar* 25: 83 (1923). 36 references.

LIPPMANN, E. O. v. Rhamnose. In *his* *Chemie der Zuckerarten*, 1: 163-190 (1895). Bibl. through text.

NEUBERG, C., and REWALD, R. Rhamnose. In *Abderhalden, Biochem. Handl.* 2: 303-309 (1911); 8: 116-117 (1914). About 100 footnotes.

ZEMPLÉN, GÉZA. Rhamnose. In *Abderhalden, Biochem. Handl.* 10: 391-395 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Rhamnose. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 926-929 (1922). Bibl. footnotes.

See also CARBOHYDRATES.

RHAMNUS BARK

GATHERCOAL, E. N. The pharmacognosy of the medicinal rhamnus barks. *J. Am. Pharm. Assoc.* 4: 369-371 (1915). 104 references.

RHODIUM

FRIEND, J. N. Rhodium. In *his* *Text-book* 9, pt. 1: 154-173 (1920). Bibl. footnotes.

LERDIE, E. Rhodium. In *Frémy, Enc. chim.* 3, 17^e cahier: 379-382 (1901).

PÉCHARD, —. Rhodium. In *Moissan, Chim. min.* 5: 926-955 (1906). 324 footnotes.

See also PLATINUM (Howe), RARE EARTHS.

RIBOSE

ZEMPLÉN, GÉZA. Ribose. In *Abderhalden, Biochem. Handl.* 10: 387-389 (1923). Bibl. footnotes.

RICIN

PFEILER, WILLY. Ueber den Nachweis von Rizin in Futtermitteln mit Hilfe der serologischen (Präzipitations-, Komplementablenkungs- und Konglutinations-) Methoden sowie der Hämagglutination. *Landw. Jahrb.* 53: 582-583 (1919). 25 references.

"Ricin and ricinus." Ind.-Cat. S. G. O., 1st ser., 12: 201 (1891); 2nd ser., 14: 600-601 (1909).

RICINOLIC ACID

MEYER-JACOBSON. Ricinus-ölsäure. In *their Lehrb. org. Chem.* 1, pt. 2: 633-636 (1913). 40 references.

See also FATS, OILS AND WAXES.

ROCKS

BUCKMAN, H. O. Bibliography of analyses of fresh rocks and their residues. *Trans. Am. Ceram. Soc.* 13: 379-384 (1911). 24 rocks reported.

BUCKMAN, H. O. Bibliography of rock weathering. *Trans. Am. Ceram. Soc.* 13: 364-379 (1911). 156 references.

COLE, G. A. J. Rocks and their origin. Cambridge, Univ. Press, 1922. Bibl., p. 162-169.

IDDINGS, JOSEPH P. Chemical composition of igneous rocks expressed by means of diagrams with reference to rock classification on a quantitative chemico-mineralogical basis. *U. S. Geol. Sur., Prof. Paper No. 18*, 1903. 98 p.

IDDINGS, JOSEPH P. Igneous rocks. II. Classification, texture and classification, description and occurrence. New York, 1913. 685 p. Bibl., p. 659-674. 977 references.

JOHANNSEN, ALBERT. A quantitative mineralogical classification of igneous rocks—revised. *J. Geol.* 28: 38-60, 158-177, 210-232 (1920). 150 references.

LANG, R. [Weathering.] *Fortschr. Mineral. Krist.* 7: 175-224 (1922). 71 references.

NIKLAS, H. Chemisches Verwitterung der Silikate auf der Gesteine mit besonderer Berücksichtigung des Einflusses der Humusstoffe. Berlin, 1912. 143 p.

OSANN, A. Versuch einer chemischen Classification der Eruptivgesteine. *Tschermak's Mineral. Petr. Mitt.*, n. s., 19: 445-450; 20: 346-403; 444-448 (1900-1902). 770 references to analyses.

WASHINGTON, HENRY S. Chemical analyses of igneous rocks published from 1889 to 1913, inclusive, with a critical discussion of the character and use of analyses. *U. S. Geol. Sur., Prof. Paper No. 99*, 1917. 1201 p. 8602 analyses with references to original publications. Revision of Prof. Paper No. 14, 1903.

WASHINGTON, HENRY S. The superior analyses of igneous rocks from Roth's Tabellen, 1869-1884, arranged according to the quantitative system

of classification. U. S. Geol. Sur., Prof. Paper No. 28, 1904. 68 p. 1800 analyses with references.

ROSINDULINE

MEYER-JACOBSON. Rosindulin. *In their* Lehrb. org. Chem. 2, pt. 3: 1429-1432 (1920). Bibl. footnotes.

ROTATORY POWER. See OPTICAL ACTIVITY.

RUBBER

BARROW, J. R. History of the development of direct uses for latex in the rubber and other industries. *India Rubber Rev.* 33: 1236-1246 (1923). Patents.

BARY, PAUL. La régénération der caoutchouc. *Rev. gén. chim. pure appl.* 15: 243-250, 267-270 (1912). Largely patents.

BARY, PAUL. Le caoutchouc. Paris, Donoud, 1923. 255 p. Bibl. footnotes.

BEDFORD, CLAYTON, and WINKLEMAN, HERBERT A. Systematic survey of rubber chemistry; a bibliography, with copious abstracts, of the entire literature of rubber chemistry and closely allied subjects; thoroughly indexed by authors and subjects and completely cross-referenced; together with a patent index and introductory chapters summarizing the present status of rubber chemistry. New York, Chem. Cat. Co., 1923. 385 p. Author index, p. 75-222; patent index, p. 377-385.

CUSHMAN, JOSEPHINE A. A special library for the rubber industry. Akron, Ohio, Municipal Univ., 1920. 21 p.

DITMAR, RUDOLF. Der Kautschuk. Berlin, Springer, 1912. 140 p. 200 patents on p. 114-124.

DITMAR, RUDOLF. Kautschuk. *In* Abderhalden, Biochem. Handl. 7: 777-791 (1912). 150 footnotes.

DITMAR, R. Technologie des Kautschuks. Vienna, Hartleben, 1915.

DITMAR, R. Die Kautschukchemie. *Kolloid-Z.* 5: 177-186 (1909); 30 footnotes. 7: 278-287 (1910); 39 footnotes. 10: 41-45, 88-97 (1912); 93 footnotes. 12: 49-54, 85-96 (1913); 70 footnotes. 15: 36-49 (1914); 80 footnotes. 16: 39-53 (1915); 50 footnotes.

DITMAR, R. Der pyrogene Zerfall des Kautschuks. *Gummi-Ztg.* 18: 1013, 1038, 1058 (1904); 19: 336 (1904). 69 footnotes. Bibl., p. 1060-1061.

DUBOSC, A., and LUTTRINGER, A. Rubber: its production, chemistry and synthesis in the light of recent research. 1918. 383 p. Bibl. footnotes.

Patents on reclaimed rubber, p. 41-45.

EMBDEN, FRIEDRICH. Fortschritte auf dem Gebiete des Kautschuks und der Guttapercha (1919-1923). *Z. angew. Chem.* 37: 561-569, 594-598 (1924). 261 footnotes.

ESCH, W. Jahresbericht ueber die Fortschritte der Kautschuk-, Guttapercha- und Balata-Industrie. *Chem.-Ztg.* 28: 171-173 (1904); 30 footnotes. 29: 265-270 (1905); 83 footnotes. 30: 195-198 (1906); 48 footnotes.

FALCONNER, H., SEELIGMANN, T., and TORRILHON, G. L. India rubber and gutta-percha. London, Scott, 1903. 402 p. Bibl., p. 385-396. 404 references.

FISCHER, E. J. Regenieren und anderweitige Verwendung von vulkanisierten Kautschukabfällen. *Kunststoffe* 1: 477-478 (1911). 143 patents.

FONROBERT, E. Der Kautschuk, 1919-1920. *Kolloid-Z.* 27: 316-326 (1920); 129 footnotes. 29: 148-156, 200-204 (1921). 230 footnotes.

FONROBERT, EWALD. Nachweis, Isolierung und Reindarstellung auf dem Gebiete des Kautschuks. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 10: 1-138 (1921). Bibl. footnotes.

GARELLI, F. Rivista dei lavori recenti pubblicati sui caucci. *Ann chim. appl.* 1: 339-357 (1914). 91 footnotes.

GAUNT, R. The viscosity of rubber solutions. *J. Soc. Chem. Ind.* 32: 447-452 (1914). 30 footnotes.

HALEN, S. Tabelle der neueren Verfahren zur Fällung von Kautschukmilch. *Kunststoffe* 14: 117-118 (1924); *India Rubber Rev.* 25: 34, 36 (1925). 31 patents.

HARRIES, C. Beiträge zur Kenntniss der Konstitution des Kautschuks und verwandte Verbindungen. *Ann.* 406: 173-226 (1914). Bibl. footnotes.

HARRIES, C. Ueber Abbau und Aufbau studien auf dem Gebiete der natürlichen und künstlichen Kautschukarten. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 10: 139-198 (1921). Bibl. footnotes.

HILLEN, G. H. Arbeiten ueber Kautschuk und Guttapercha. *Z. angew. Chem.* 27: 489-494 (1914); 56 footnotes. 28: 349-356, 357-361 (1915); 244 footnotes. 29: 241-244, 253-256 (1916); 193 footnotes. 32: 293-297, 301-304, 309-312 (1916); 403 footnotes.

RUBBER—Cont'd

- HÜBENER, G. Die Entwicklung der Chemie und Technologie des Kautschuks in den Jahren 1905-1910. *Chem.-Ztg.* 35: 469-471, 486-488, 494-496, 513-515 (1911). 75 footnotes.
- HÜBENER, G. Zusammenfassende Besprechung der bisher erschienen Arbeiten ueber die Natur und Aufbereitung des Latex. *Kolloid-Z.* 16: 5-13 (1915). 20 footnotes.
- HÜBENER, G. Die Kautschukchemie im Jahre 1915. *Kolloid-Z.* 18: 152-162 (1916). References through text.
- JACOBSON, F. Ueber den Harzgehalt des Kautschuks. *Gummi-Ztg.* 30: 5-6, 28-30, 53-56 (1915). 85 footnotes.
- KAUSCH, OSKAR. Regenerierung von Altkautschuk. *Kunststoffe* 1: 146-151 (1911). Patents.
- LUFF, B. D. W. The chemistry of rubber. London, Benn, 1923. 237 p. Bibl. footnotes.
- MEYER-JACOBSON. Kautschukarten. In *their Lehrb. org. Chem.* 2, pt. 4: 87-124 (1924). Bibl. footnotes.
- OLSSON-SEFFER, PEHR. Bibliography of rubber. *Am. Rev. Tropical Agr.*, 1: 173-177, 214-216, 255-260 (1910).
- PELIZZOLA, CAMILLO. Sulla peciosità della gomma greggia e sull' invecchiamento della gomma vulcanizzata. *Giorn. chim. ind. appl.* 4: 200-203 (1922). 37 footnotes.
- PORRITT, B. D. The rubber industry—past and present. *J. Royal Soc. Arts* 67: 252-267 (1919); *India Rubber J.* 57: 411-415, 445-447 (1919). Early patent and literature references.
- PORRITT, B. D. The chemistry of rubber. London, Gurney, 1913. 96 p. Bibl., p. 88-93, 170 references.
- ROEMER, MARY V. Books and articles on india rubber. *St. Louis Pub. Library Bull* 16: 29-32 (1918). Classified.
- RUTGERS, A. A. L. Rubber bibliography, 1901-1916. Mededeelingen van het Algemeen Proefstation der A. V. R. O. S., Rubber ser., No. 5, 1917. 84 p. *Arch. Rubbercult. Nederland. Indie* 1: 455-547 (1917). Annotated.
- SLINGERVOET, RAMONDT A. Zur Geschichte der Kautschukforschung. Zusammenstellung der wissenschaftlichen Veröffentlichungen aus dem Gesamtgebiet des Kautschuks. Dresden, Steinkopff, 1907. 70 p. Bibl., p. 53-65.
- SOCIETY OF CHEMICAL INDUSTRY. India rubber. In *Reports of the progress of applied chemistry* 1: 197-225 (1916); 2: 337-352 (1917); 3: 298-320 (1918); 4: 315-346 (1919); 5: 332-350 (1920); 6: 353-378 (1921); 7: 308-333 (1922); 8: 347-382 (1923); 9: 374-401 (1924). Bibl. footnotes.
- SPIRE, C., and SPIRE, A. Le caoutchouc en Indo-Chine. Paris, Challanel, 1905. 262 p. 100 references.
- STEVENS, HENRY P. Rubber. In *First report on colloid chemistry*, 1917, p. 41-43. Fourth report, 1922, p. 376-380.
- TASSILLY, EUGENE. Caoutchouc et guttapercha. Paris, Doin, 1911. 395 p. Bibl., p. 381-386. 150 references.
- TERRY, H. L. India rubber and its manufacture. 1920. 294 p.
- TWISS, D. F. Rubber as a colloid. *J. Soc. Chem. Ind.* 38: 47-50T (1919).
- U. S. Training Service. Training in the rubber industry. *Training Bull.* No. 20, 1919. 75 p. Bibl., p. 65-75.
- WHITBY, G. S. Plantation rubber and the testing of rubber. New York, Longmans, 1920. 550 p. Bibl., p. 503-547.
- ZIMMERMANN, A. Der Manihot-Kautschuk. Jena, 1913. 342 p. Bibl., p. 330-337.
- RUBBER: Analysis.**
- TUTTLE, J. B. The analysis of rubber. New York, Chem. Cat. Co., 1922. 155 p. Bibl., p. 121-138. 501 references.
- RUBBER: Substitutes.**
- FISCHER, E. J. Hartgummiersatzmassen ohne Kautschukzusatz. *Kunststoffe* 8: 1-7 (1918). Patents.
- HALEN, S. Verfahren zur Herstellung von Faktis und anderer Kautschukersatzstoffen. *Kunststoffe* 4: 315-316 (1914). 39 patents.
- KAUSCH, OSKAR. Kautschuk- und Guttapercha-Ersatzstoffe. *Kunststoffe* 1: 408-411, 430-433, 474-476 (1911). Patents.
- RUBBER: Synthetic.**
- BARROWS, FRANK E. Synthetic caoutchouc; a review of the literature. *Chem. Eng.* 14: 355-362 (1911). References through text.
- DITMAR, RUDOLF. Die Synthese des Kautschuks. Dresden, Steinkopff, 1912. 124 p. Patents, with abstracts, p. 57-124.
- KAUSCH, OSKAR. Tabellarische Uebersicht der Patente und wichtigsten Veröffentlichungen betreffend der Kautschuksynthese und die Herstellung der hierzu erforderlichen Ausgangsstoffe. *Kunststoffe* 2: 341-346

- (1912); 4: 47-50, 69-72 (1914); 5: 123-125, 137-138 (1915); 9: 33-35 (1919). Patent literature.
- KING, ANDREW H. Synthetic rubber. *Met. Chem. Eng.* 16: 511-518 (1917). 36 references.
- KONDAKOF, I. Le caoutchouc synthétique, ses homologues et ses analogues. *Rev. gén. chim. pure appl.* 15: 129-143, 162-168, 328-333, 338-349, 381-390, 408-414, 429-434 (1912); 6: 9-15, 45-50 (1913). *Bibl. footnotes.*
- LEBEDEF, S. V. Sur la polymerisation des carbures diéthyléniques. *Rev. gén. chim. pure appl.* 17: 129-133, 145-150, 156-168, 179-184 (1915).
- POND, FRANCIS J. A review of pioneer work on the synthesis of rubber. *J. Am. Chem. Soc.* 36: 165-199 (1914). *Bibl. footnotes.*
- STERN, E. Der synthetische Kautschuk. *Chem.-Ztg.* 37: 789-792 (1913). 72 footnotes. *Fortschritte Chem.* 7: 81-90 (1913). References through text.
- RUBIDIUM**
- CHABRIÉ, C. Rubidium. *In* Moissan, *Chim. min.* 3: 12-24 (1904). 85 footnotes.
- EPHRAIM, FRITZ. Rubidium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 2, pt. 1: 188-214 (1906). References through text.
- FORCRAND, R. DE. Rubidium et cæsium. *In* Frémy, *Enc. chim.* 3, 2^e cahier: 39-40 (1888).
- HINRICHSSEN, W. Rubidium und Cäsium. *In* Abegg, *Handb. anorg. Chem.* 1, pt. 1: 452-454 (1907). 114 references.
- WALKER, A. J. Rubidium. *In* Friend, *Textbook*, 2: 188-199 (1924). *Bibl. footnotes.*
- See also ALKALI METALS.
- RUTHENIUM**
- FRIEND, J. N. Ruthenium. *In* his *Textbook* 9, pt. 1: 136-153 (1920). *Bibl. footnotes.*
- PÉCHARD, —. Ruthénium. *In* Moissan, *Chim. min.* 5: 690-716 (1906). 240 footnotes.
- See also PLATINUM (Howe); RARE EARTHS.
- RUTHENIUM TETROXIDE**
- KRAUSS, F. Ruthenium tetroxide. *Z. anorg. allgem. Chem.* 131: 360 (1923). 26 references.
- RUTILE**
- DOELTER, C. Rutil (TiO_2). *In* his *Handb. Mineralchem.* 3, pt. 1: 16-26 (1918). *Bibl. footnotes.*
- HAAS, GUSTAV. Rutil. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 29-33 (1921). References through text.
- See also TITANIUM OXIDES.
- SACCHARIC ACID**
- MEYER-JACOBSON. Zuckersäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 702 (1913). 23 references.
- NEUBERG, C., and REWALD, B. *d*-Zuckersäure. *In* Abderhalden, *Biochem. Handl.* 2: 510-512 (1911). About 50 footnotes.
- SACCHARIN**
- BEYER, OSKAR. Ueber die Kontrolle und Herstellung von Saccharin (Benzoesäuresulfimid). Zürich, Rascher, 1918. 141 p. *Bibl.*, p. 7-12.
- BEYER, OSKAR. *Handbuch der Saccharin-Fabrikation* (Benzoesäuresulfimid). Zürich, Rascher, 1923. 143 p. *Bibl.*, p. 5-10. Supplement to the above *bibl.*
- GREENMAN, E. D. Reading list on saccharin. *Special Libraries*, 11: 106-112 (1920). 128 references.
- HERTER, C. A. References to the literature of saccharin. U. S. Dept. Agr., Rept. No. 94, 1911, p. 211-227. 39 references with abstracts.
- HERZOG, WALTER. Bericht ueber die Fortschritte auf dem Gebiete der Chemie der synthetischen Süsstoffe und verwandten Verbindungen. *Z. angew. Chem.* 35: 133-137 (1922) 36: 223-227 (1923). *Bibl. footnotes.*
- MEYER-JACOBSON. Benzoesäuresulfimid (Saccharin). *In* their *Lehrb. org. Chem.* 2, pt. 1: 570-571 (1896).
- "Saccharin." *Ind.-Cat. S. G. O.*, 1st ser., 12: 424-425 (1891); 2nd ser., 15: 4-5 (1910).
- SACCHAROSE**
- LIPPMANN, E. v. Saccharose. *In* his *Chemie der Zuckerarten*, 2: 1039-1427 (1904). *Bibl. through text.*
- MEYER-JACOBSON. Rohrzucker. *In* their *Lehrb. org. Chem.* 1, pt. 2: 1004-1007 (1913). *Bibl. footnotes.*
- NEUBERG, C., and REWALD, B. Rohrzucker (Saccharose). *In* Abderhalden, *Biochem. Handl.* 2: 389-404 (1911); 8: 191-210 (1914). *Bibl. footnotes.*
- "Saccharose." *Ind.-Cat. S. G. O.*, 2nd ser., 15: 7 (1910).
- ZEMPLÉN, GÉZA. Rohrzucker (Saccharose). *In* Abderhalden, *Biochem. Handl.* 10: 567-594 (1923). *Bibl. footnotes.*
- ZEMPLÉN, GÉZA. Saccharose. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 5: 952-953 (1922). *Bibl. footnotes.*
- See also CARBOHYDRATES.

SAFFRON

"Saffron." Ind.-Cat. S. G. O., 1st ser., 12: 438 (1891); 2nd ser., 15: 19 (1910).

See also DYES.

SAFRANINE

MEYER-JACOBSON. Safranin. *In their* Lehrb. org. Chem. 2, pt. 3: 1405-1411 (1920). Bibl. footnotes.

SAFROL

EINBECK, H. Safrol. *In* Abderhalden, Biochem. Handl. 1: 660-663 (1911). About 50 footnotes.

SALICIN

EULER, H., and LUNDBERG, J. Salicin. *In* Abderhalden, Biochem. Handl. 2: 613-616 (1911); 8: 333-335 (1914). 70 footnotes.

"Salicine." Ind.-Cat. S. G. O., 1st ser., 12: 474 (1891); 2nd ser., 15: 46 (1910).

ZEMPLÉN, GÉZA. Salicin. *In* Abderhalden, Biochem. Handl. 10: 848-858 (1923). Bibl. footnotes.

SALICYLALDEHYDE

MEYER-JACOBSON. Salicylaldehyd. *In their* Lehrb. org. Chem. 2, pt. 1: 518 (1896).

WITTE, E. Salicylaldehyd. *In* Abderhalden, Biochem. Handl. 1: 825-826 (1911). 50 footnotes.

SALICYLATES

HANZLIK, PAUL J. The salicylates: a historical and critical review of the literature. Reprinted from Annual Report (1914) of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association. 1914. 55 p.

"Salicylates." Ind.-Cat. S. G. O., 1st ser., 12: 475 (1891); 2nd ser., 15: 46-47 (1910).

THOBURN, T. W., and HANZLIK, P. J. Quantitative recovery of salicyl from urine and other body fluids. *J. Biol. Chem.* 23: 180 (1915). 18 references.

SALICYLIC ACID

DOHRN, M., and THIELE, A. Salicylsäure. *In* Abderhalden, Biochem. Handl. 1: 1241-1250 (1911). 225 footnotes (includes derivatives).

HEINTZ, W., and LIMPRICH, R. Ueber den Nachweis und die Bestimmung von Salicylsäure in Fruchtsäften. *Z. Nahr.-Genussm.* 25: 706-717 (1913). 65 footnotes.

MEYER-JACOBSON. Salicylsäure. *In their* Lehrb. org. Chem. 2, pt. 1: 627-635 (1902). Bibl. footnotes.

"Salicylic acid." Ind.-Cat. S. G. O., 1st ser., 1: 88-91 (1880); 2nd ser., 1: 118-119 (1896); 3rd ser., 1: 125-126 (1918).

SALIPYRIN

"Salipyrin." Ind.-Cat. S. G. O., 2nd ser., 15: 48-49 (1910).

SALIVA

SCHULZ, F. N. Speicheldrüsen und Speichel. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 20-50 (1910). 132 footnotes.

"Saliva." Ind.-Cat. S. G. O., 1st ser., 12: 477-480 (1891); 2nd ser., 15: 49-52 (1910).

STARR, HENRY E. Determination of the hydrogen ion concentration of human mixed saliva. *J. Biol. Chem.* 54: 43-54 (1922). 52 references.

SALOL. See PHENYL SALICYLATE.**SALOPHEN**

"Salophen." Ind.-Cat. S. G. O., 2nd ser., 15: 61 (1910).

SALMON

CLOUGH, RAY W. A biochemical study of Pacific coast salmon with particular reference to the formation of indole and scatole during decomposition. Washington (State) Univ., Puget Sound Biol. Sta., Pub. 3, No. 67: 195-272 (1922). Bibl., p. 268-272.

SALT

BUSCHMANN, J. O. Das Salz: dessen Vorkommen und Verwertung in sämtlichen Staaten der Erde. 2 vols. Leipzig, 1906-1919. Bibl. footnotes.

COLE, L. HEBER. Report on the salt deposits of Canada and the salt industry. Canada, Dept. Mines, Mines Br., Bull. No. 325, 1915. 152 p. Bibl., p. 141-152. 76 references.

GRABAU, A. W. Geology of the non-metallic mineral deposits other than silicates. I. Principles of salt deposition. New York, 1920. 435 p. Bibl. footnotes.

HARTOGH, F. E. Salinenindustrie. *In* Brüder und d'Ans, Fortschritte 1: 2635-2640 (1923). German patents.

PHALEN, W. C. Salt, bromine and calcium chloride. U. S. Geol. Sur., Mineral Resources, 1914, pt. 2: 304-306. 43 references.

PHALEN, W. C. Salt resources of the United States. U. S. Geol. Sur., Bull. No. 669, 1919. 284 p. Bibl., p. 250-251. 183 references. Bibl. by states through text.

See also SODIUM CHLORIDE.

SALTPETER. See SODIUM NITRATE.**SALVARSAN. See ARSPHENAMINE.****SAMARIUM. See RARE EARTHS.****SAMPLING**

SHERWOOD, W. J., and BERNEWITZ, M. W. v. Bibliography of literature on sampling. U. S. Bur. Mines, Repts. of Investigations, No. 2336, 1922. 85 p., mimeographed. About 1100

references with author and subject index.

SANATOGEN

"Sanatogen." Ind.-Cat. S. G. O., 2nd ser., 15: 82 (1910).

SAND

HOPKINS, L. L. Sand: its occurrence, properties and uses; a bibliography. Carnegie Library of Pittsburgh, 1918. 72 p. About 600 references. Includes molding sands, glass sands and filter sands.

STONE, R. W. Sand and gravel. U. S. Geol. Sur., Mineral Resources, 1912, pt. 2: 634-636. 47 references.

See also MOLDING SANDS, GLASS SANDS, QUARTZ.

SAND LIME BRICK

EMLEY, WARREN E. Manufacture and properties of sand lime brick. U. S. Bur. Stand., Tech. Paper No. 85, 1917. 41 p. 50 footnotes.

PARR, S. W., and ERNEST, T. R. A study of sand lime brick. Ill. State Geol. Sur., Bull. 18. 1912. Thesis, Univ. Ill, 1910. 83 p. 61 references. Those references in English are reproduced in U. S. Geol. Sur., Mineral Resources, 1913, pt. 2: 22.

See also BRICK.

SANITATION

BUSWELL, A. M. Chemistry of sanitation. J. Ind. Eng. Chem. 14: 840-842 (1922). 41 references.

"Disposal of offal." Ind.-Cat. S. G. O., 1st ser., 10: 112-113 (1889); 2nd ser., 12: 126-130 (1907).

SMITH, ARTHUR W. Selected bibliography on sanitary science and allied subjects. Boulder, Colo., 1909. 37 p. 420 references, annotated.

See also BLEACHING POWDER (Hooker); GARBAGE; SEWAGE DISPOSAL; VENTILATION.

Seriel

Public health engineering abstracts. Issued weekly in mimeograph form by U. S. Public Health Service. 1921-. Classification: Water supply; sewerage, sewage and industrial wastes; garbage and refuse; milk and other foods; sanitation; air conditioning.

SANTONIN

DOHRN, M., and THIELE, A. Santonin. In Abderhalden, Biochem. Handl. 1: 1348-1359 (1911). 100 footnotes.

MEYER-JACOBSON. Santonin. In their Lehrb. org. Chem. 2, pt. 2: 448 (1903).

"Santonin." Ind.-Cat. S. G. O., 1st ser., 12: 527-528 (1891); 2nd ser., 15: 103 (1910).

ZWALUWENBURG, A. VAN. Santonin: bibliography with abstracts of methods of production, etc. Pharm. Arch. 2: 1-11 (1899). Annotated.

SAPONINS

BLAU, HEINRICH. Beiträge zur Kenntniss der Saponine. Dissertation, Zürich, 1911. 103 p. Bibl., p. 91-101.

KOBERT, K. Die Saponine. In Abderhalden, Biochem. Handl. 7: 145-228 (1912). 400 footnotes.

"Saponin." Ind.-Cat. S. G. O., 2nd ser., 15: 106 (1910).

SIEBURG, E. Isolierung, Nachweis und Abbaustudien auf den Gebiete der Saponine. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 10: 545-584 (1921). Bibl. footnotes.

SARCOSINE

SCHIEBLER, HELMUTH. Sarkosin. In Abderhalden, Biochem. Handl. 4: 462-471 (1911). 50 footnotes.

See also AMINO ACIDS.

SAUSAGES

"Sausages." Ind.-Cat. S. G. O., 1st ser., 12: 545-546 (1891); 2nd ser., 15: 119-120 (1910).

SCANDIUM

LITTLE, H. F. V. Scandium. In Friend, Textbook 4: 204-215 (1917). Bibl. footnotes.

MELLOR, J. W. Scandium. In his Inorg. theor. Chem. 5: 480-493 (1924).

MEYER, R. J. Ueber das Scandium. Z. anorg. Chem. 86: 257-290 (1914). Bibl. footnotes.

See also RARE EARTHS.

SCATOLE

MEYER-JACOBSON. Skatol. In their Lehrb. org. Chem. 2, pt. 3: 231-232 (1915). Bibl. footnotes.

ZEMPLÉN, GÉZA. Skatol. In Abderhalden, Biochem. Handl. 4: 868-876 (1911). 100 footnotes.

SCHIFF'S BASES

MEYER-JACOBSON. Aldehydderivate des Anilins (Schiff'sche Basen). In their Lehrb. org. Chem. 2, pt. 1: 178-179 (1895).

SCHWEIZER'S REAGENT

PETERS, FRANZ. Schweizer'schen Reagens. In Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 1: 792-795 (1909). References through text.

See also CELLULOSE.

SCOPOLAMINE

"Scopolamine." Ind.-Cat. S. G. O., 2nd ser., 15: 338-341 (1910).

SEA WATER

McCLENDON, J. F. Composition of sea water in relation to marine organisms. J. Biol. Chem. 28: 135-152 (1916). 40 references.

SEA WATER—Cont'd

MAYER, ALFRED G. Hydrogen ion concentration and electrical conductivity of the surface water of the Atlantic and Pacific. Washington, Carnegie Inst., Dept. Marine Biol., Papers 18: 85 (1922).

"Sea water." Ind.-Cat. S. G. O., 1st ser., 12: 834-835 (1891); 2nd ser., 15: 368-369 (1910).

WELLS, ROGER C. Carbon dioxide content of sea water at Tortugas. Washington, Carnegie Inst., Dept. Marine Biol., Papers 18: 93 (1922).

See also SALT.

SEAWEED

HENDRICK, JAMES. The value of seaweeds as raw materials for chemical industry. J. Soc. Chem. Ind. 35: 565-574 (1916). 13 footnotes.

See also FERTILIZERS, KELP, MARINE PRODUCTS.

SEBACIC ACID

MEYER-JACOBSON. Sebacinsäure. In *their Lehrb.* org. Chem. 1, pt. 2: 405 (1913). 50 references.

SECRETIN

DOWNS, ARDREY W., and EDDY, NATHAN B. Secretin and a suggestion as to its therapeutic value. Endocrinology 7: 718-719 (1923). 60 references.

SECRECTIONS

BIEDL, ARTUR. The internal secretory organs, their physiology and pathology. New York, Wood, 1913. 586 p. Bibl., p. 446-486.

BRUGSCH, THEODOR. Dünndarm und seine Sekrete. In Oppenheimer, Handb. Biochem. 3, pt. 1: 102-121 (1910). 106 footnotes. 2nd ed., 4: 558-576 (1924). 120 footnotes.

FÜRTH, O. v. Produkte der inneren Sekretion tierischer Organe. In Abderhalden, Biochem. Handl. 5: 495-509 (1911).

VINCENT, SWALE. Internal secretions and the ductless glands. London, Arnold, 1912. 464 p. Bibl., p. 413-454.

VINCENT, SWALE. An introduction to study of secretions. New York, Longmans, 1924. 168 p. Bibl., p. 159-163.

See also names of various secretions.

SEDATIVES

KOCHMANN, M. Schlafmittel. In Heffter, Handb. exp. Pharmakologie, 1: 389-448 (1923). Bibl. footnotes.

RENNER, ALBRECHT. Ueber Schlafmittel und ihre Wirkung. Ergeb. inneren Medizin 23: 234-251 (1923). 848 references. Discusses adalin, chloral, hedonal, isopral, luminal, neuronal, nirvanol, sulfonal, trional, veronal, etc.

SEDIMENTATION

DEAN, WILLARD A. "Settling" problems. Trans. Am. Electrochem. Soc. 37: 97-100 (1920). 60 references.

LINCK, G. Ueber den Chemosismus der tonigen Sedimente. Geol. Rundsch. 4: 289 (1913). 23 references.

SELENIC ACID

LINNE, BR. Selenensäuren. In Gmelin-Kraut, Handb. anorg. Chem. I, pt. 1: 769-781 (1907).

SELENIOS ACID

LINNE, BR. Selenige Säure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 760-768 (1907).

SELENIUM

BIANCHI, IL selenio. La fototelegrafia. Il "fotografono." La fotometria a selenio. La televisione. La teleidografia. Milan, Hoepli, 1919. 136 p. Bibl., p. 127-136.

FONZES-DIACON, —. Sélénium. In Moissan, Chim. min. 1: 443-487 (1904). 196 footnotes.

GUTBIER, A., and ENGEROFF, F. Ueber ein neues Verfahren zur Bereitung von kolloidem Selen. Ein Beitrag zur Kenntniss der Hydrolysemethoden. Kolloid-Z. 15: 193-201, 210-216 (1914). 62 footnotes.

HALEN, S. Neue Forschung betreffend das Selen und seine Verbindungen. Edel-Erden und -Erze 2: 105-107 (1921).

LENHER, VICTOR. Occurrence, chemistry and uses of selenium and tellurium. Trans. Am. Inst. Mining Met. Eng. 69: 1035-1055 (1923). 43 footnotes.

LINNE, BR. Selen. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 705-804 (1907). References through text.

RIES, CHRISTOPH. Die elektrischen Eigenschaften und die Bedeutung des Selen für die Elektrotechnik. Berlin, Die Mechaniker, 1913. 189 p. Bibl., p. 161-183.

RIES, CHRISTOPH. Das Selen. München, Huber, 1918. 379 p. Bibl., p. 350-375.

SAUNDERS, A. P. Allotropic forms of selenium. J. Phys. Chem. 4: 424-428 (1900). Covers 1818-1898.

SKOWRONSKI, S. Selenium and tellurium. Mineral Ind. 30: 616-624 (1921); 31: 621-625 (1922). About 50 references.

SELENIUM CHLORIDE

DITZ, HUGO. Chlor und Selen. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 210-214 (1909).

SELENIUM OXIDE

LINNE, BR. Seliendioxyd. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 757-760 (1907).

SEMICARBAZIDE

MEYER-JACOBSON. Semicarbazid. In *their* Lehrb. org. Chem. 1, pt. 2: 1449-1456 (1913). Bibl. footnotes.

SERINE

ZEMPLÉN, GÉZA. Serin. In Abderhalden, Biochem. Handl. 4: 523-530 (1911); 9: 100-101 (1915). About 80 footnotes.

See also AMINO ACIDS.

SERPENTINE

BENSON, W. N. The origin of serpentine, a historical and comparative study. Am. J. Sci. (4) 46: 729-731 (1918). 138 references.

LEITMEIER, H. Serpentin ($H_2MgSi_2O_6$). In Doelter, Handb. Mineralchem. 2, pt. 1: 385-434 (1914).

See also ASBESTOS, MAGNESIUM SILICATE.

SERUM

"Chemical and physiological constituents of serum." Ind.-Cat. S. G. O., 1st ser., 12: 911 (1891); 2nd ser., 15: 480-483 (1910); 3rd ser., 3: 88-89 (1922).

SAMUELY, FRANZ. Serum albumin. Serum globulin. In Abderhalden, Biochem. Handl. 4: 58-65, 82-86 (1910); 9: 15-16, 17-19 (1915). Bibl. footnotes.

"Serum albumins. Serum globulin." Ind.-Cat. S. G. O., 2nd ser., 15: 487, 489-490 (1910).

See also BLOOD, PROTEINS.

SEWAGE

ARDERN, EDWARD. Sewage purification with reference to colloid chemistry. In Second report on colloid chemistry, 1919, p. 93-95. Chronological bibl.

BABBITT, HAROLD E. Sewerage and sewerage treatment. New York, Wiley, 1922. 531 p. Bibl. on activated sludge process, p. 480-481.

BACH, —, and FRIES, F. Das Abwasserbeseitigungswesen nach dem Weltkriege. Zent. ges. Hyg. 5: 74-80 (1923-1924). 235 references.

BUSWELL, A. M. Activated sludge studies, 1920-1922. Ill. State Water Sur., Bull. No. 18. 150 p. Bibl., p. 113-115. 75 references.

DUNBAR, WM. P. Principles of sewage treatment. London, Griffin, 1908. Bibl., p. xv-xix.

FRANK, LESLIE C., and RHYNUS, C. P. The treatment of sewage from single house and small communities. U. S. Public Health, Bull. No. 101, 1920. 117 p. Bibl., p. 113-117.

GAGE, STEPHEN DEM. Biochemistry of sewage purification. J. Am. Chem. Soc. 27: 327-363 (1905); Tech. Quarterly 18: 5-39 (1905). 115 references.

HERING, RUDOLPH. Catalogue of publications relating to sewerage. Bull. U. S. National Board of Health, 3: suppl. 16, app. 3. 1882.

HOLMES, W. C. Sewage disposal and treatment. Carnegie Library of Pittsburgh, Mo. Bull., Nov., 1910. 96 p. Classified by special methods used.

HOMMON, H. B., et al. Treatment and disposal of sewage. U. S. Public Health Reports 35: 101-130 (1920). About 225 references, classified by methods, scattered through the report.

JAMESON, ROBERT M. Methods of sewage disposal for Texas cities. Univ. Texas, Bull. No. 362 (Municipal research series, No. 4), 1914. 64 p. Bibl., p. 51-61.

KINNICUTT, LEONARD P., WINSLOW, C-E, A., and PRATT, R. W. Sewage disposal. 2nd ed. New York, Wiley, 1919. 547 p. Bibl., p. 511-526.

LEDERER, ARTHUR. Some observations on the formation of hydrogen sulfide in sewage. Am. J. Public Health 3: 552-561 (1913). 22 footnotes.

PORTER, J. EDWARD. The activated sludge process of sewage treatment: a bibliography of the subject with brief abstracts, patents, etc., compiled from current literature. Rochester, General Filtration Co., 1921. 2nd ed. 117 p. 606 references, arranged chronologically, with author index.

SCHREIB, H. Fortschritte in der Reinigung der Abwässer. Chem.-Ztg. 24: 1090-1093 (1900); 29 footnotes. 25: 970-972 (1901); 36 footnotes. 26: 299-302 (1902); 58 footnotes. 27: 313-316 (1903); 40 footnotes. 28: 267-269 (1904); 36 footnotes. 30: 1111-1114 (1906); 60 footnotes. 31: 1133-1134, 1157-1158 (1907); 75 footnotes. 33: 1289-1291, 1300-1301 (1909); 96 footnotes.

"Sewage." Ind.-Cat. S. G. O., 1st ser., 12: 918-944 (1891); 2nd ser., 15: 500-533 (1910).

U. S. Library of Congress. List of references on sewage and sewage disposal. 1922. 19 p., typewritten.

WINSLOW, C-E., and PHELPS, EARLE B. History of sewage-disposal problem. U. S. Geol. Sur., Water Supply Paper No. 185, 1906. Bibl., p. 149-154, 110 references.

See also GARBAGE, SANITATION, WASTE, WATER.

SEWER GAS

"Sewer gas." Ind.-Cat. S. G. O., 1st ser., 12: 946-947 (1891); 2nd ser., 15: 535 (1910).

SEX ORGANS

"Chemistry of testicle." *Ind.-Cat. S. G. O.*, 2nd ser., 17: 759 (1921).

GERHARTZ, HEINRICH. Männliche Geschlechtsorgane. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 344-358 (1910). 77 footnotes. 2nd ed., 4: 652-662 (1924). 59 footnotes.

LOEWY, A. Neuere Untersuchungen zur Physiologie der Geschlechtsorgane. *Ergeb. Physiol.* 2: 130-132 (1903). 65 references.

VINCENT, SWALE. Physiology, physiological chemistry and experimental pathology of the female gonads. *In* Barker, *Endocrinology and metabolism* 2: 551-571; references, 5: 235-284 (1922).

WHEELER, HOMER. Physiology, physiological chemistry and experimental pathology of the testis. *In* Barker, *Endocrinology and Metabolism*, 2: 431-471; references, 5: 235-284 (1922).

ZUNTZ, LEO. Weibliche Geschlechtsorgane. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 359-381 (1910). 134 footnotes.

SHERADIZING PROCESS

STOREY, OLIVER W. The sheradizing process. *Met. Chem. Eng.* 14: 683-691 (1916). 27 footnotes.

See also ZINC.

SIDERIT. See FERROUS CARBONATE.**SILAGE**

KIESSELBACH, T. A. Some facts and theories about silage. *Ann. Rept. Nebr. Corn Improvers' Assoc.* 6: 127-131 (1915). References to U. S. or state Agr. Expt. Sta. Repts.

SILICA AND SILICATES

ASCH, W., and ASCH, D. The silicates in chemistry and commerce. London, Constable, 1914. 476 p. *Bibl.*, p. 328-339. 780 references.

AUDLEY, JAMES A. Silica and the silicates. New York, Van Nostrand, 1921. 374 p. *Bibl.* at end of chapters.

BECHE, F. Ueber die Zusammenhang der physikalischen, besonders der optischen Eigenschaften mit der chemischen Zusammensetzung der Silicate. *In* Doelter, *Handb. Mineralchem.* 2, pt. 1: 1-26 (1914). *Bibl.* footnotes.

BOEKE, H. E. Die Methoden zur Untersuchungen des Molekularzustandes von Silikatschmelzen. *Neues Jahrb. Mineral. Geol.* 39: 64-78 (1914). *Bibl.* footnotes.

DOELTER, C. Allgemeines ueber die Synthese der Silicate. *In* *his* *Handb. Mineralchem.* 1: 594-618 (1912). *Bibl.* footnotes.

DOELTER, C. Die Silicatschmelzen. *In* *his* *Handb. Mineralchem.* 1: 628-804 (1912). *Bibl.* footnotes.

DOELTER, C. Konstitution der Silicate. *In* *his* *Handb. Mineralchem.* 2, pt. 1: 61-109 (1914).

DOELTER, C., *et al.* Silicate dreiwertiger Metalle. *In* *his* *Handb. Mineralchem.*, vol. 2, 1917. 1144 p. *Bibl.* footnotes.

DOELTER, C., *et al.* Siliciumdioxid, SiO₂. *In* *his* *Handb. Mineralchem.* 2, pt. 1: 115-273 (1914). *Bibl.* footnotes.

ENDELL, K., and RIEHE, R. Ueber die Umwandlungen des Kieselsäureanhydrids bei höheren Temperaturen. *Z. anorg. Chem.* 79: 239-259 (1912). *Bibl.* footnotes.

HIMMELBAUER, A. Allgemeines ueber Kieselsäuren. *In* Doelter, *Handb. Mineralchem.* 2, pt. 1: 201-223 (1914). *Bibl.* footnotes.

JACOBY, R. Siliciumdioxid und Hydrate desselben. Silikate. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 1: 131-174 (1912). References through text.

KANTER, ERHARD H. Ueber Erdalkalisilikate, Kieselsäure und Alkalisilikate. Dissertation, Erlangen, 1902. 59 p. *Bibl.*, p. 55-59. 175 references.

KOENIGSBERGER, J. Paragenesis der natürlichen Kieselsäureminerale. *In* Doelter, *Handb. Mineralchem.* 2, pt. 1: 53-61 (1914).

KOENIGSBERGER, J., and MÜLLER, W. J. Beschreibung einiger synthetischer Silikatminerale und synthetischer Versuche nebst Folgerung für das natürlichen Vorkommen. *Neues Jahrb. Mineral. Geol.* 44: 402-459 (1920-1921).

LENHER, V., and MERRILL, H. B. Solubility of silica. *J. Am. Chem. Soc.* 39: 2630-2632 (1917). 32 references.

MCDOWELL, J. SPOTT. Study of the silica refractories. *Trans. Am. Inst. Mining Eng.* 57: 57-59 (1917). 50 references.

MARSHALL, ALBERT E., and WINSHIP, W. W. Bibliography of fused silica. New York, Thermal Syndicate, 1915. 15 p.

MAUZELIUS, ROB. Silico-Zirkoniate. *In* Doelter, *Handb. Mineralchem.* 3, pt. 1: 151-171 (1918). *Bibl.* footnotes.

MOREY, G. W., and NIGGLI, PAUL. The hydrothermal formation of silicates. *J. Am. Chem. Soc.* 35: 1105-1130 (1913); *Z. anorg. Chem.* 83: 391-415 (1913). 81 references, anno-

- tated. Chronological, 1845-1913, with tabular summary by minerals.
- REITER, H. H. Experimentelle Studien an Silikatschmelzen. *Neues Jahrb. Mineral. Geol.* 22: 260-264 (1906). 94 references, 1879-1906.
- RIEKE, REINHOLD. Die Arbeitsmethoden der Silikatchemie. Braunschweig, Vieweg, 1917. Bibl., p. 92-98.
- ZAMBONINI. Silicotitanate. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 54-71 (1918). Bibl. footnotes.
- See also* REFRACTORIES.
- SILICATES: Analysis.**
- DITTRICH, M. Analytische Methoden der Silicate. *In* Doelter, Handb. Mineralchem. 1: 560-594 (1912). Bibl. footnotes.
- HILLEBRAND, W. F. Analysis of silicate and carbonate rocks. *U. S. Geol. Sur., Bull. No. 700*, 1919. 285 p. Bibl. footnotes.
- SILICIC ACID GEL**
- JACOBY, R. Kieselsäuresols. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 146-150, 1256 (1912).
- SILICIDES**
- BARADUC-MULLER, L. [Metallic silicides. The action of silicon carbide on some metallic oxides.] *Rev. métal* 7: 657-834 (1911). Bibl. of silicon alloys.
- See also* BORIDES.
- SILICON**
- GROSSMANN, H. Silicium. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 364-372 (1909). Classified by compounds.
- CAVEN, R. M. Silicon. *In* Friend, Textbook 5: 176-231 (1917). Bibl. footnotes.
- CURIE, J. Silicium. *In* Frémy, Enc. chim. 2, 3^e cahier: 281-288 (1884).
- JACOBY, R. Silicium. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 101-310, 1241-1318 (1912). References through text.
- KAHLENBERG, LOUIS, and TRAUTMANN, WM. J. Reduction by means of silicon. *Trans. Am. Electrochem. Soc.* 39: 377-416 (1921). 63 footnotes.
- LEBEAU, P. Silicium. *In* Moissan, Chim. Min. 2: 385-488 (1905). 576 footnotes.
- LOTTERMOSER, —. Kolloides Silicium. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 881-882 (1909). 30 references.
- See also* SILICA.
- SILICON: Analysis.**
- JACOBY, R. Nachweis, Bestimmung und Trennung des Siliciums. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 120-124, 1248-1249 (1912).
- SILICON CARBIDE**
- HÖNIGSCHMID, O. Siliciumcarbid. *In* Doelter, Handb. Mineralchem. 1: 552-556 (1912). 15 footnotes.
- JACOBY, R. Siliciumkarbide. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 211-213 (1912).
- See also* CARBIDES, SILICIDES.
- SILICON TETRACHLORIDE**
- HUTCHINS, OTIS. Silicon tetrachloride. *Trans. Am. Electrochem. Soc.* 35: 309-311 (1919). References to physical properties.
- JACOBY, R. Siliciumtetrachlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 192-197 (1912).
- SILICON TETRAFLUORIDE**
- JACOBY, R. Siliciumtetrafluorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 181-188 (1912).
- SILICOTUNGSTIC ACID**
- KIESER, A. J. Silicowolframsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 854-872 (1912).
- SILK**
- DENHAM, WM. S., and CRÜMMETT, ALAN. Surveys of recent progress in the dyeing, printing and allied industries—Silk. *J. Soc. Dyers Colourists* 41: 19-27 (1925). Bibl. through text.
- FOLTZER, J. Artificial silk and its manufacture. London, Pitman, 1921. Patent literature.
- HOTTENROTH, V. Kunstseide. *In* Ullmann, Enzyk. tech. Chem. 7: 342 (1919); 12: 446-447 (1923).
- SILBERMANN, H. Die Seide, ihre Geschichte, Gewinnung und Vorarbeitung. Dresden, 1897. 2 vols. Classified list of patents.
- SÜVERN, K. Fortschritte auf dem Gebiete der künstlichen Seide. *Z. angew. Chem.* 36: 21-24 (1923). 106 footnotes.
- SÜVERN, K. Die künstliche Seide. 3rd ed. Berlin, Springer, 1912. 631 p. 4th ed., 1920. Complete list of patents.
- WHEELER, EDWARD. The manufacture of artificial silk in relation to colloid chemistry. *In* 5th report on colloid chemistry, 1923, p. 56-57. 53 references.
- WORDEN, E. C. Nitrocellulose silks; artificial filament formation. Cuprammonium artificial filaments. *In* his Technology of cellulose esters 1: 2621-2655 (1921). Many hundred references.
- See also* CELLULOSE ESTERS (Worden); FIBERS; VISCOSE.

SILVER

- BAUR, E. Silber. *In* Abegg, Handb. anorg. Chem. 2, pt. 1: 731-735 (1907). 180 references.
- COLSON, A. Argent. *In* Moissan, Chim. min. 5: 484-601 (1906). 1086 references.
- CRONSHAW, HARRY B. Silver ores. London, Murray, 1921. 152 p. Bibl., p. 147-152.
- DE FORCRAND, R. L'argent et ses composés. *In* Frémy, Enc. chim. 3, 15^e cahier, 1st part: 453-460; 2nd part: 157-158 (1889). Classified.
- GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Silver. (1913-1919.) London, 1923. 218 p. Bibl., p. 203-218.
- GUTBIER, A. Ueber kolloides Silber. Kolloid-Z. 19: 22-32, 280-287 (1916). 50 footnotes.
- LOTTERMOSER, —. Kolloidchemie des Silbers. *In* Abegg, Handb. anorg. Chem. 2, pt. 1: 751-752 (1907). 50 references.
- MELLOR, J. W. Silver. *In* his Inorg. theor. chem. 3: 295-490 (1923). History, 15 references; occurrence, 15 references; extraction, 50 references; desilverization of lead, 20 references; purification of silver, 150 references; physical properties, 600 references; chemical properties, 500 references; atomic weight, 150 references.
- SCHLENK, W. Silber. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 1-232, 1288-1546 (1914). References through text.
- "Silver and compounds." Ind.-Cat. S. G. O., 1st ser., 13: 26-29 (1892); 2nd ser., 15: 635 (1910).
- SMITH, ERNEST A., and TURNER, HAROLD. The properties of standard or sterling silver, with notes on its manufacture. J. Inst. Metals 22: 191-192 (1919). Chronological, 1574-1917.
- WALKER, A. J. Silver. *In* Friend, Textbook 2: 290-321 (1924). Bibl. footnotes.
- SILVER: Metallurgy.** See CYANIDE PROCESS, GOLD.
- SILVER: Protein compounds.**
- BOTTENSTERN, O. V. Ueber Eiweissverbindungen des Silbers. Z. Chemotherap. 3: 1014-1035 (1914).
- SILVER BROMIDE**
- MELLOR, J. W. Silver bromide. *In* his Inorg. theor. chem. 3: 418-426 (1923). About 200 references.

SCHLENK, W. Silber und Brom. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 107-114 (1914).

See also PHOTOGRAPHY.

SILVER CARBONATE

MELLOR, J. W. Silver carbonate. *In* his Inorg. theor. chem. 3: 456-459 (1923). 30 references.

SCHLENK, W. Silberkarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 145-146 (1914).

SILVER CHLORIDE

MELLOR, J. W. Silver chloride. *In* his Inorg. theor. chem. 3: 390-408 (1923). About 450 references.

SCHLENK, W. Silberchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 94-102 (1914).

See also PHOTOGRAPHY.

SILVER FLUORIDE

MELLOR, J. W. Silver fluoride. *In* his Inorg. theor. chem. 3: 386-390 (1923). 35 references.

SCHLENK, W. Silberfluorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 87-89 (1914).

SILVER IODIDE

MELLOR, J. W. Silver iodide. *In* his Inorg. theor. chem. 3: 426-438 (1923). About 300 references.

SCHLENK, W. Silber und Jod. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 114-119 (1914).

See also PHOTOGRAPHY.

SILVER NITRATE

BROWN, MORTIMER J. A new method for the study of silver peroxy-nitrate. Trans. Am. Electrochem. Soc. 30: 327-346 (1916). Bibl. footnotes on electrolysis of silver nitrate.

MELLOR, J. W. Silver nitrate. *In* his Inorg. theor. chem. 3: 459-477 (1923). About 300 references.

SCHLENK, W. Silbernitrat. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 56-73, 1367-1380 (1914).

"Silver nitrate." Ind.-Cat. S. G. O., 1st ser., 13: 27-29 (1892); 2nd ser., 15: 638-639 (1910).

SILVER OXIDES

MELLOR, J. W. Silver oxides. *In* his Inorg. theor. chem. 3: 368-380 (1923). About 150 references.

SCHLENK, W. Silber und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 38-48, 1352-1361 (1914).

SILVER PHOSPHATE

MELLOR, J. W. Silver phosphates. *In* his Inorg. theor. chem. 3: 485-490 (1923). 60 references.

SCHLENK, W. Silberphosphate. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 127-133 (1914).

SILVER SULFATE

MELLOR, J. W. Silver sulfate. *In his* Inorg. theor. Chem. 3: 450-456 (1923). 100 references.

SCHLENK, W. Silbersulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 77-80, 1385-1388 (1914).

SILVER SULFIDE

MELLOR, J. W. Silver sulfide. *In his* Inorg. theor. chem. 3: 438-450 (1923). 200 references.

SCHLENK, W. Silbersulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 5, pt. 2: 73-77 (1914).

SIZING

FARROW, FREDERICK D. Sizing—a review of the literature. Shirley Inst. Mem. 2: 194-203 (1923); Color Trade J. 13: 146-151 (1923). 54 references.

See also PAPER, TEXTILES.

SKIN

ROSENTHAL, GEORGE J. Biochemical studies of skin. J. Am. Leather Chem. Assoc. 11: 494-495 (1916). 40 references.

SCHULZ, F. N. Hautdrüsen und Tränen. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 448-469 (1910). 77 footnotes. 2nd ed., 5: 385-418 (1924). 162 footnotes.

SEYMOUR-JONES, F. L. The chemical constituents of skin. J. Ind. Eng. Chem. 14: 130 (1922); J. Am. Leather Chem. Assoc. 17: 116-122 (1922). 20 references.

UNNA, P. G., and GOLODETZ, L. Biochemie der Haut. *In* Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, 327-396. 76 footnotes.

SLATE

BOWLES, OLIVER. The technology of slate. U. S. Bur. Mines, Bull. No. 218, 1922. 132 p. Bibl., p. 124-127. Largely confined to the economic phase of the industry.

DALE, T. N. Slate deposits and slate industry of the United States. U. S. Geol. Sur., Bull. No. 275, 1906. 154 p. Bibl., p. 138-145. 149 references.

DALE, T. N. Slate in the United States. U. S. Geol. Sur., Bull. No. 586, 1914. 220 p. Bibl., p. 205-213. 190 references.

U. S. Library of Congress. List of references on slate and the slate industry. 1922. 7 p.

SLIME CAKE

FREE, E. E. Properties of slime cakes. Eng. Mining J. 101: 1068-1070, 1105-1108 (1916). Bibl. footnotes.

See also COLLOIDS.

SMELTER FUMES. *See* SMOKE.**SMOKE: Effect on vegetation.**

BASKERVILLE, CHARLES. The legal status of industries giving rise to noxious gases; the smelter smoke question in the United States. Proc. 7th Intern. Congr. Appl. Chem. 11: 100-102 (1909). 46 references, mostly to legal aspects.

BRIZI, U. [The effect of gases and fumes upon cultivated plants.] Staz. Sper. Agr. Ital. 36: 279-384 (1903). 100 references.

FRAZER, PERSIFOR. Causes of injury to vegetation by furnace gases. Trans. Am. Inst. Mining Eng. 38: 520-555 (1907); Bull. No. 15, 377-434 (1907). 48 references, annotated.

HAMOR, W. A. Index to the literature of the action of noxious gases on vegetation. Mineral Ind. 17: 901-918 (1908). 233 references; chronological with author index.

HASELHOFF and LINDAU. Die Beschädigung der Vegetation durch Rauch. Leipzig, 1903. Bibl., p. 395-400.

HAYWOOD, J. K. Injury to vegetation and animal life by smelter wastes. U. S. Dept. Agr., Bur. Chem., Bull. No. 113, 1910. Bibl. footnotes.

KNIGHT, LEE I., and CROCKER, WM. Toxicity of smoke. Bot. Gaz. 55: 337-372 (1913). 44 references.

SABACHNIKOFF, V. Contribution à l'étude des fumées et des poussières industrielles dans leurs rapports avec la végétation. Thesis, Univ. Nancy, 1913. 252 p. 200 references.

STOKLASA, JULIUS. Die Beschädigung des Vegetation durch Rauchgase und Fabriksexhalationen. 1923. Bibl., p. 473-487.

See also SULFUR DIOXIDE.

SMOKE PREVENTION

LIEFMANN, H. Ueber die Rauch- und Russfrage insbesondere vom gesundheitlichen Standpunkte und eine Methode des Russnachweises in der Luft nachzuweisen. 1908. Bibl., p. 74-90. 229 references.

McCLELLAND, ELLWOOD H. Bibliography of smoke and smoke prevention. Mellon Inst. Ind. Res., Smoke Investigations, Bull. No. 2, 1913. 164 p. 1500 references. Revision of earlier list (1907) by Carnegie Library of Pittsburgh. Deals mainly with coal smoke. Includes sources of smoke, composition, effects and prevention.

McKAY, ROBERT J. Recent progress in smoke abatement and fuel technology. Mellon Inst. Ind. Res., Smoke Investigation Bull. No. 10, 1922. 62 p. Bibl., p. 58-62.

SMOKE PREVENTION—Cont'd

RANDALL, D. T. The smoke problem at boiler plants; a preliminary report. U. S. Bur. Mines, Bull. No. 39, 1912. 31 p. Selected list of 105 references. Revision of U. S. Geol. Sur., Bull. No. 334, 1908.

"Smoke prevention." Ind.-Cat. S. G. O., 1st ser., 13: 227 (1892); 2nd ser., 16: 79-80 (1911).

SMOKELESS POWDER. *See* EXPLOSIVES.**SOAP**

BRANNT, WM. T. Manufacture of soap and candles. 1888. Contains list of U. S. patents.

BRIEGER, KURT. Untersuchungen ueber das Kребitzverfahren zur Herstellung von Seifen. Zürich, Leemann, 1921. 45 p. Bibl. footnotes.

LEDERER, E. L. Neuerungen und Fortschritte auf dem Gebiete der Seifenindustrie. Z. angew. Chem. 37: 637-642 (1924). 56 footnotes.

McBAIN, J. W. Colloidal chemistry of soap. *In* Third report on colloid chemistry, 1920, p. 29-31. 30 references.

McBAIN, J. W. The study of soap solutions and its bearing upon colloid chemistry. *In* Comptes rendus de la quatrième conférence internationale de la chimie, 1923, Appendix, p. 29-32; Am. Dyestuff Rep. 12: 825-826 (1923); Chimie et industrie 11: 7 (1924). 33 references.

MARTIN, GEOFFREY. The modern soap and detergent industry, including glycerol manufacture. 3 vols. London, Lockwood, 1924-1925. Includes modern patents and literature.

"Soap." Ind.-Cat. S. G. O., 1st ser., 13: 235-236 (1892); 2nd ser., 16: 87-89 (1911).

See also COLLOIDS.

SODA PULP

CHRISTIANSEN, CHRISTIAN. Ueber Natronzellstoff; seine Herstellung und chemische Eigenschaften. Berlin, Borntraeger, 1913. 154 p. 11 p. of bibl.

See also PAPER.

SODIUM

BATSFORD, HOWARD E. Metallic sodium. Chem. Met. Eng. 26: 933-935 (1922). About 500 references; chronological, from 1855-1920.

CARRIER, C. F., JR. The extraction of metallic sodium. Electrochem. Met. Ind. 4: 442-446, 475-480 (1905).

EPHRAIM, FRITZ. Natrium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 273-282 (1906).

HINRICHSSEN, —. Natrium. *In* Abegg, Handb. anorg. Chem. 1, pt. 1: 320-334 (1907). 744 references.

ROUSSEAU, M. G. Sodium. *In* Frémy, Enc. chim. 3, 2^e cahier: 196-207 (1888).

"Sodium and salts." Ind.-Cat. S. G. O., 1st ser., 13: 298-304 (1892); 2nd ser., 16: 137-150 (1911).

THOMAS, V. Sodium. *In* Moissan, Chim. min. 3: 276-415 (1904). 2276 footnotes (includes derivatives).

WALKER, A. J. Sodium. *In* Friend, Textbook 2: 81-151 (1924). Bibl. footnotes.

See also ALKALI METALS (Mellor).

SODIUM ACETATE

EPHRAIM, FRITZ. Essigsäures Natrium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 451-453 (1906).

SODIUM ALLOYS

SACK, M. Ueber die Entstehung und Bedeutung von Natriumlegierungen bei der kathodischen Polarisation. Z. anorg. Chem. 34: 286-352 (1903). 90 footnotes. 40 references to sodium amalgam, p. 338.

See also ALLOYS, AMALGAMS; names of various metals.

SODIUM ALUMINIUM SULFATE

EPHRAIM, FRITZ. Natriumaluminiumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 672-674 (1909).

SODIUM AMIDE

EPHRAIM, FRITZ. Natriumamid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 297-299 (1906).

SODIUM ARSENATE

EPHRAIM, FRITZ. Natriumarsenate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 532-539 (1908).

SODIUM BICARBONATE

EPHRAIM, FRITZ. Natriumbikarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 446-451 (1906).

See also ALKALI METALS (Mellor), SODIUM CARBONATE.

SODIUM BORATE

EPHRAIM, FRITZ. Borsäures Natrium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 415-423 (1906).

"Sodium borate." Ind.-Cat. S. G. O., 2nd ser., 16: 139 (1911).

SODIUM BROMIDE

EPHRAIM, FRITZ. Natriumbromid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 370-373 (1906).

See also ALKALI METALS (Mellor).

SODIUM CACODYLATE

"Sodium cacodylates." Ind.-Cat. S. G. O., 2nd ser., 16: 140-141 (1911).

SODIUM CARBONATE

EPHRAIM, FRITZ. Natriumkarbonat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 426-446 (1906).

GEUTHER, TH. Sodaindustrie und Nebenzweige. *In* Bräuer und d'Ans, Fortschritte 1: 2807-2813 (1923). German patents.

MELLOR, J. W. Manufacture of sodium carbonate. *In his* Inorg. theor. chem. 2: 728-747 (1922). 100 references.

"Sodium carbonate." Ind.-Cat. S. G. O., 1st ser., 13: 299 (1892); 2nd ser., 16: 138-139 (1911).

WEGSCHEIDER, RUD. Natriumcarbonate. *In* Doelter, Handb. Mineralchem. 1: 141-192 (1912). About 325 footnotes.

SODIUM CHLORATE

EPHRAIM, FRITZ. Natriumchlorat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 367-370 (1906).

See also CHLORIC ACID (Mellor).

SODIUM CHLORIDE

EPHRAIM, FRITZ. Natriumchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 353-366 (1906).

FOSTERT, CARL. Ueber das Wachstum von Chlornatriumkristallen. Neues Jahrb. Mineral. Geol. 33: 266-324 (1912). Bibl. footnotes.

"Sodium chloride." Ind.-Cat. S. G. O., 1st ser., 13: 299-301 (1892); 2nd ser., 16: 141-144 (1911).

See also ALKALI METALS (Mellor); SALT.

SODIUM CHROMATE

STERN, DORA. Natriumchromate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 663-669 (1912).

SODIUM FLUORIDE

EPHRAIM, FRITZ. Natriumfluorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 351-353 (1906).

See also ALKALI METALS (Mellor).

SODIUM HYDROXIDE

BILLITER, J. Ätzalkali und Chlor. Elektrochemische Verfahren. *In* Bräuer und d'Ans, Fortschritte 1: 2926-2931 (1923). German patents.

EPHRAIM, FRITZ. Natriumhydroxid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 285-293 (1906).

See also ALKALI METALS (Mellor); ELECTROCHEMISTRY.

SODIUM IODIDE

EPHRAIM, FRITZ. Natriumjodid. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 373-375 (1906).

See also ALKALI METALS (Mellor).

SODIUM MOLYBDATE

KIESER, A. J. Natriummolybdate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1006-1013 (1912).

SODIUM NITRATE

EPHRAIM, FRITZ. Natriumnitrat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 302-303 (1906).

KALIAN, A. Natriumnitrat. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 267-281 (1918). Bibl. footnotes.

MCCLELLAND, E. H. Sodium nitrate industry of Chile. Carnegie Library of Pittsburgh, Mo. Bull. 13: 144-150 (1908).

See also ALKALI METALS (Mellor); NITRATES; NITROGEN FIXATION.

SODIUM PERBORATE

BRÄUER, A. Natriumperborate. *In* Bräuer und d'Ans, Fortschritte 1: 519-520 (1921). 78 German patents.

See also SODIUM BORATE.

SODIUM PEROXIDE

EPHRAIM, FRITZ. Natriumperoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 293-296 (1906).

VANINO, LUDWIG. Das Natriumsuperoxyd. Vienna, Hartsleben, 1908. 72 p. Bibl., p. 68-69.

See also ALKALI METALS (Mellor); HYDROGEN PEROXIDE.

SODIUM PHOSPHATES

EPHRAIM, FRITZ. Natrium und Phosphor. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 386-406 (1906).

See also ALKALI METALS (Mellor).

SODIUM SALICYLATE

"Sodium salicylate." Ind.-Cat. S. G. O., 1st ser., 13: 302-303 (1892); 2nd ser., 16: 147-148 (1911).

See also SALICYLATES.

SODIUM SILICATE

DOELTER, C. Natrium-Aluminiumsilicate. *In his* Handb. Mineralchem. 2, pt. 2: 208-228 (1917). Bibl. footnotes.

DOELTER, C. Natrium-Aluminiummetasilicat. *In his* Handb. Mineralchem. 2, pt. 2: 343-408 (1917). Bibl. footnotes.

DOELTER, C. Natriumferrimetasilicat. *In his* Handb. Mineralchem. 2, pt. 2: 333-343 (1917). Bibl. footnotes.

DOELTER, C., et al. Chlor- und schwefelhaltige Natrium-Aluminiumsilicate. *In his* Handb. Mineralchem. 2, pt. 2: 229-333 (1917). Bibl. footnotes.

DOELTER, C., and MICHEL, H. Mischungen von Natriumaluminiumsilicaten mit Calciumaluminiumsilicaten. *In* Doelter, Handb. Mineralchem. 2, pt. 3: 217-315 (1921). Bibl. footnotes.

JACOBY, R. Natriumaluminiumsilicate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 273-282, 1303-1306 (1912).

SODIUM SILICATE—Cont'd

JACOBV, R. Natriumsilikate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 227-237 (1912).

MICHEL, H. Natronanorthit—Carnegieit. *In* Doelter, Handb. Mineralchem. 2, pt. 3: 290-312 (1921). Bibl. footnotes.

SCHRERO, NORRIS. Water glass, a bibliography. Carnegie Library, Pittsburgh, 1922. 87 p. Classified under: History, general, properties, manufacture, application, analysis.

WAESER, B. Kieselsäure und Alkalisilicate. *In* Bräuer and d'Ans, Fortschritte 1: 2548 (1922). German patents.

See also SILICA, SILICATES.

SODIUM SULFATE

EPHRAIM, FRITZ. Natriumsulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 321-335 (1906).

WUITE, J. P. Das System Natriumsulfat-Wasser. *Z. physik. Chem.* 86: 349-383 (1913-1914). Bibl. footnotes.

See also ALKALI METALS (Mellor).

SODIUM SULFIDES

EPHRAIM, FRITZ. Schwefelnatrium. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 308-318 (1906).

See also ALKALI METALS (Mellor).

SODIUM SULFITE

EPHRAIM, FRITZ. Natriumsulfit. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 318-321 (1906).

SODIUM THIOSULFATE

EPHRAIM, FRITZ. Natriumthiosulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 1: 336-339 (1907).

SODIUM TRINITRIDE

TURKENTINE, J. W. The corrosion of some metals in sodium trinitride solution. *J. Am. Chem. Soc.* 33: 803-828 (1911). Bibl. footnotes.

SODIUM TUNGSTATE

KIESER, A. J. Natriumwolframate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 803-821 (1912).

SODIUM VANADATE

PRANDTL, W. Natriumvanadate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 155-164 (1908).

SOIL(S)

ARNOLD, TH. Ueber die Entstehungsweise salpeter- und salpetrigsaure Salze in Moorböden. *Landw. Jahrb.* 51: 297-328 (1918). Bibl. footnotes.

CHRISTENSEN, A. [Foreign literature relating to soils and agronomy, 1906-1907.] *Tidsskr. Landbr. Planteavl.* 16: 759-816 (1909); 17: 640-692 (1910).

COFFEY, G. N. Study of the soils of the United States. U. S. Dept. Agr., Bur. Soils, Bull. No. 85, 1912. 114 p. Bibl., p. 100-114.

FAILYER, G. H. Barium in soils. U. S. Dept. Agr., Bur. Soils, Bull. No. 72, 1910. 23 p. Bibl. footnotes.

FLEISCHER, MORITZ. Die Bodenkunde auf chemisch-physikalischer Grundlage. 5th ed. 1922. 248 p. Bibl., p. 239-242.

KLEBERGER, W. Grundzüge der Pflanzenernährungslehre und Düngerlehre. Hannover, Schaper, 1914. 2 pts. 354, 291 p.

MACINTIRE, W. E., WILLIS, L. G., and HARDY, J. I. The non-existence of magnesium carbonate in humid soils. Tenn. Agr. Expt. Sta., Bull. No. 107: 151-202 (1914). 55 references.

MERKLE, FRED G. The decomposition of organic matter in soils. *J. Am. Soc. Agron.* 10: 281-302 (1918). 44 references.

NELLER, J. R. Influence of growing plants upon oxidation processes in the soil. *Soil Science* 13: 155-158 (1922). 66 references.

PARROZZANI, A. [Physical and chemical conditions of cultivated and forest soils.] *Ann. Staz. Sper. Agrum. Frutticol. Acireale* 2: 23-46 (1914).

DE REGNY, P. V. [On the behavior of minerals in soils.] *Staz. Sper. Agr. Ital.* 41: 51-77 (1908). 48 references.

DE REGNY, P. V. "Red soil." *Bull. Agr. Intell.* 6: 1136-1138 (1915). Origin and chemical analyses.

RUSSELL, EDWARD J. Soil conditions and plant growth. New York, Longmans, 1921. 168 p. Bibl., p. 154-166. 323 references.

SCHREINER, OSWALD, and LATHROP, ELBERT C. Chemistry of steam-treated soils. *J. Am. Chem. Soc.* 34: 1242 (1912). 27 references.

STEWART, R. Quantitative relationships of carbon, phosphorus and nitrogen in soils. Ill. Agr. Expt. Sta., Bull. No. 145: 91-127. 82 references.

STUNTZ, S. C., and FREE, E. E. Bibliography of colian geology. U. S. Dept. Agr., Bur. Soils, Bull. No. 68: 175-263 (1911). 2532 references.

TRESSLER, DONALD K. Solubility of soil potash in various salt solutions. *Soil Science* 6: 256-257 (1918).

WULFF, A. [Agro-geological bibliography.] *Meded. Landbouwhoogsch (Wageningen)* 20, 1921. 283 p. Mostly references to foreign works.

Serial

International Reports on Pedology. 1911-. Each number contains "Referate" and list of books on matters relating to chemistry and physics of soils.

Journal of ecology. 1913-. Abstracts articles on soil reaction, soil fauna and flora, chemical works on soils, soil water.

See also FERTILIZERS.

SOIL: Alkali.

DORSEY, C. W. Alkali soils of the United States. U. S. Dept. Agr., Bur. Soils, Bull. No. 35, 1906. 196 p. Bibl., p. 58-60. 50 references. Also bibl. footnotes.

FRAPS, G. S. Alkali soils. Irrigation waters. Texas Agr. Expt. Sta., Bull. No. 130: 5-28 (1910).

SOIL: Analysis.

BURGESS, PAUL S. Studies on a drained marsh soil unproductive for peas. Univ. Calif., Pub. Agr. Sci., 4: 393-396 (1922).

DAVIS, CHAS. W. Studies on the phenoldisulfonic acid method for determining nitrates in soils. J. Ind. Eng. Chem. 9: 295 (1917). Thesis, Iowa State Coll., 1917. 14 p. Bibl., p. 13-14.

GILE, PHILIP L. Estimation of colloidal material in soils by adsorption. U. S. Dept. Agr., Bull. No. 1193, 1924. 42 p. Bibl., p. 39-41.

HIRST, C. T., and GREAVES, J. E. Factors influencing the determination of sulfates in soils. Soil Science 13: 247-249 (1922). 47 references.

STEINRIEDE, FRANZ. Anleitung zur mineralogischen Bodenanalyse, insbesondere zur Bestimmung der feineren Bodenmineralien unter Anwendung der neueren petrographischen Untersuchungsmethoden. Leipzig, Engelmann, 1921. 238 p. Bibl., p. 229-234.

STOKLASA, JULIUS. Methoden zur biochemischen Untersuchungen des Bodens. In Abderhalden, Handb. biol. Arbeitsm. 11, pt. 3: 1-262 (1924). Bibl. footnotes.

SOIL: Organic compounds.

JODIDI, SAMUEL L. The chemistry of the soil nitrogen. J. Franklin Inst. 175: 483-495 (1913). 32 footnotes and bibl. of 25 references.

JODIDI, S. L. [Present status of soil chemistry, with particular reference to organic compounds.] Landw. Vers.-Sta. 85: 359-391 (1914). 71 references.

LATHROP, E. C. The organic nitrogen compounds of soils and fertilizers. J. Franklin Inst. 183: 489-498 (1917). 200 references.

MORROW, CLARENCE A., and GORTNER, ROSS A. Study of nitrogen distribution in different soil types. Soil Science 5: 297-331 (1917). 50 footnotes.

SCHREINER, O., and SKINNER, J. J. Nitrogenous soil constituents and their bearing on soil fertility. U. S. Dept. Agr., Bur. Soils, Bull. No. 87, 1912. 84 p. Bibl. footnotes.

SCHREINER, O., and SHOREY, E. C. Pyrimidine derivatives and purine bases in soils. J. Biol. Chem. 8: 385-393 (1910). 30 footnotes.

SOIL ACIDITY

ATKINS, W. R. G. Some factors influencing the hydrogen ion concentration of the soil and its relation to plant distribution, etc. Sci. Proc. Royal Soc. Dublin 16: 429-434 (1922).

BRIOUX, CHARLES J. B. Détermination de l'acidité des sols par la méthode Hutchinson-MacLennan. Ann. sci. agron. 37: 244 (1920).

CHRISTENSEN, H. R. [Investigation of methods for the determination of the soil reaction.] Tidsskr. Plantæavl. 23: 1-83 (1916). 33 references.

DEMOLON, A. La réaction des sols et ses applications en agronomie. Ann. sci. agron. 37: 113-114 (1920).

GREGOIRE, ACH. Contribution à l'étude de l'acidité des terres. Bull. soc. chim. Belg. 26: 336-342, 362-373, 386-409 (1912). 40 footnotes.

MACINTIRE, W. H. The nature of soil acidity with regard to its quantitative determination. J. Am. Soc. Agronomy 13: 137-161 (1921). 74 references.

MIRASOL, J. J. Aluminium as a factor in soil acidity. Soil Science 10: 153-193 (1920). 84 references.

RICE, F. E., and OSUGI, S. Inversion of cane sugar by soils and allied substances and the nature of soil acidity. Soil Science 5: 337-358 (1918). 105 references.

SHARP, L. T., and HOAGLAND, D. R. Acidity and absorption in soils as measured by the hydrogen electrode. J. Agr. Res. 7: 123-145 (1916). 35 references.

SWANSON, C. O. Soil reaction in relation to calcium adsorption. J. Agr. Res. 26: 83-123 (1923). 47 references.

TRUOG, EMILE. Soil acidity. Its relation to the growth of plants. Soil Science 5: 169-195 (1918). 49 references.

SOIL AIR

BIZZELL, J. A., and LYON, T. L. Effect of certain factors on the carbon dioxide content of soil air. J. Am. Soc. Agron. 10: 97-112 (1918). 23 footnotes.

SOIL AIR—Cont'd

TURPIN, H. W. The carbon dioxide of the soil air. New York, Cornell Agr. Expt. Sta., Mem. No. 32: 319-362 (1920).

SOIL ALDEHYDES

SKINNER, J. J. Soil aldehydes. J. Franklin Inst. 186: 737-741 (1918). 85 references.

See also SOIL, ORGANIC COMPOUNDS.

SOIL ALKALIES

KING, FOREST V., ERVIN, GUY, and EVANS, LOUISE. Bibliography relating to soil alkalies, compiled with special reference to deleterious action of soil alkalies and various other chemical agents on cement and concrete. U. S. Dept. Agr., Dept. Bull. No. 1314. 1925. 40 p.

SOIL ANTISEPTICS

BUISSON, J. P. DU. The extraction and saturation of soils with volatile antiseptics. Soil Science 3: 388-391 (1917). 53 references.

SOIL COLLOIDS

ANDERSON, M. S. Absorption by colloidal and non-colloidal soil constituents. U. S. Dept. Agr., Bull. No. 1122. 1922. 26 references.

BEAUMONT, A. B. Studies in the reversibility of the colloidal condition of soils. New York, Cornell Agr. Expt. Sta., Mem. No. 21: 479-524 (1919). 58 references.

BLANCK, E. Die neue kolloidchemische Forschungsrichtung in der Bodenkunde in ihrer Beziehung zur Geologie. Geol. Rundsch. 6: 413-414 (1915). 33 references.

BRADFIELD, RICHARD. Chemical nature of a colloidal clay. Univ. Mo., Agr. Expt. Sta., Res. Bull. No. 60, 1923. 60 p. Bibl., p. 58-60. 69 references.

HAGER, GEORG. Die Methoden zur Untersuchung der Bodenkolloide und ihrer Eigenschaften. In *Abderhalden, Handb. biol. Arbeitsm.* 11, pt. 3: 283-404 (1924). Bibl. footnotes.

ROBINSON, W. O., and HOLMES, R. S. The chemical composition of soil colloids. U. S. Dept. Agr., Dept. Bull. No. 1311. 1924. 42 p. Bibl., p. 39-41.

WOLKOFF, M. L. Flocculation of soil colloidal solutions. Soil Science 1: 599-601 (1916). 43 references.

See also COLLOIDS.

SOIL EXTRACTS

ANDERSON, M. S., and FRY, WM. H. Solid phases obtained by the evaporation of certain soil extracts. J. Ind. Eng. Chem. 12: 668-669 (1920). 20 references.

GREAVES, J. E., and HIRST, C. T. The soil solution. J. Ind. Eng. Chem. 14: 224-226 (1922). 23 references.

GUSTAFSON, A. F. Effect of drying soils on the water-soluble constituents. Soil Science 13: 208-213 (1922). 106 references.

LIPMAN, CHARLES B. Does CaCO_3 or CaSO_4 affect the solubility of the soil's constituents? Univ. Calif. Pub. Agr. Sci. 3, No. 10: 271-282 (1918). Bibl. footnotes.

STEWART, GUY R. Effect of season and crop growth in modifying the soil extract. J. Agr. Res. 12: 311-367 (1918). 63 references.

SOIL STERILIZATION

KOPELOFF, N., and COLEMAN, D. A. Review of investigations on soil protozoa and soil sterilization. Soil Science 3: 197-269 (1917). 337 references.

TRUGG, E. Soil constituents which inhibit the action of plant toxins. Soil Science 3: 349-351 (1917). 48 references.

WAKSMAN, SELMAN, and STARKEY, R. L. Partial sterilization of soil, microbiological activities and soil fertility. Soil Science 16: 154-156, 268, 357 (1923). 87 references.

SOIL TOXINS

RIGG, GEORGE B. Decay and soil toxins. Bot. Gaz. 61: 309-310 (1916). 30 references.

SOIL WATER

"Soil water." Ind.-Cat. S. G. O., 1st ser., 16: 147-148 (1895); 2nd ser., 16: 154-155 (1911).

See also WATER, UNDERGROUND.

SOLIDS

LANGMUIR, IRVING. The constitution and fundamental properties of solids and liquids. J. Am. Chem. Soc. 38: 2221-2295 (1916). Bibl. footnotes.

MELLOR, J. W. The kinetic theory of solids. In *his* Inorg. theor. chem. 1: 818-823 (1922). 25 references.

SOLUBILITY

COMEY, ARTHUR M., and HAHN, DOROTHY A. A dictionary of solubilities. Inorganic. 2nd ed. Macmillan, 1921. 1141 p. Bibl. notes under each entry. Compounds arranged alphabetically.

EYRE, J. V. Report on solubility. Rept. Brit. Assoc., Adv. Sci., 1910: 425-468; 1912: 795-871. Chronological bibl., 1790-1911.

FAJANS, K. Löslichkeit und Ionisation von Standpunkte der Atomstruktur. Naturwissenschaften 9: 738 (1921). 40 references.

FRIEND, J. N. Solubility, solutions and some properties of solutions. In *his* Textbook 1: 98-127 (1914). Bibl. footnotes.

GEFFCKEN, GUSTAV. Beiträge zur Kenntniss der Löslichkeitsbeeinfluss-

- ung. Z. physik. Chem. 49: 256-316 (1909). 80 footnotes.
- HILDEBRAND, JOEL. Solubility. J. Am. Chem. Soc. 38: 1452-1473 (1916). Bibl. footnotes.
- KENDALL, J., DAVIDSON, A. W., and ADLER, H. Prediction of solubility in polar solutions. J. Am. Chem. Soc. 43: 1481-1502 (1921). 50 footnotes.
- LANDOLT-BÖRNSTEIN. Gleichgewichte zwischen Wasser und anorganischen Stoffen (Löslichkeit im Wasser). In *their* Tabellen, 4th ed., 1912, 454-499; 5th ed., 1923, 632-688. References through text. Gleichgewichte je zweier organischer Stoffe. *Ibid.* 4th ed., 504-556; 5th ed., 694-706. References through text. Literatur ueber die Löslichkeit in nichtwässrigen Lösungsmitteln und in deren Gemischen mit Wasser. *Ibid.* 4th ed., 580; 5th ed., 739-742. Gegenseitige Löslichkeit von Flüssigkeiten. *Ibid.* 4th ed., 595; 5th ed., 761-762. Gaslöslichkeit in Flüssigkeiten und in festen Stoffen. *Ibid.* 4th ed., 606-610; 5th ed., 774-784. Löslichkeitsprodukte. *Ibid.* 5th ed., 1180-1187.
- LEVIN, M. Beiträge zur Theorie des Löslichkeitsbeeinflussung. Z. physik. Chem. 55: 513-536 (1906). 60 footnotes.
- ROTHMUND, V. Löslichkeit und Löslichkeitbeeinflussung. Leipzig, Barth, 1907. 196 p. Bibl. footnotes.
- SEIDELL, ATHERTON. Solubilities of inorganic and organic substances. 2nd ed. New York, Van Nostrand, 1919. 843 p. Bibl., p. 785-821, refers to determinations recorded through the book.
- TABLES ANNUELLES. Solubilité. 1: 346-427 (1910); 2: 428-488 (1911); 3: 318-344 (1912); 4: 752-826 (1913-1916). References to all numerical data published during those years.
- TIMMERMANS, J. Die kritische Lösungstemperatur von ternären Gemengen. Z. physik. Chem. 58: 210-212 (1907). 52 references.
- SOLUTION**
- ARRHENIUS, SVANTE A. Theories of solution. New Haven, Yale Univ. Press, 1912. 247 p. Bibl., p. 226-238.
- BRUNI, GIUSEPPE. Solid solutions. Chem. Rev. 1: 345-375 (1925). 80 footnotes.
- CHWOLSON, O. D. Lösungen von festen und flüssigen Körpern. In *his* Lehrbuch der Physik I, pt. 2: 242-244 (1918).
- JONES, HARRY C. Theory of solvation. Am. Chem. J. 48: 502 (1912). 45 references.
- JONES, HARRY C. Evidence bearing on the solvate theory of solution. J. Franklin Inst. 176: 704-710 (1913). 84 references.
- JONES, HARRY C. The nature of solution. New York, Van Nostrand, 1917. 380 p. Bibl., p. 359-370.
- MELLOR, J. W. Solutions. In *his* Inorg. theor. chem. 1: 506-588 (1922). About 800 references.
- "Solutions." Ind.-Cat. S. G. O., 2nd ser., 16: 167-170 (1911).
- TAMMANN, G. Ueber die Beziehung zwischen den inneren Kräften und Eigenschaften der Lösungen. Leipzig, 1907.
- TIMMERMANS, J. Recherches sur la théorie des solutions concentrées. Bull. soc. chim. Belg. 23: 129-148 (1909). 30 footnotes.
- TRAUBE, J. The cohesion pressure. A theory of solution. Ion I: 352-355 (1908). 100 references.
- WALDEN, P. Die Lösungstheorien in ihrer geschichtlichen Aufeinanderfolge. Sammlung chem. chem.-tech. Vorträge 15: 277-454 (1910). Bibl. footnotes.
- SOLUTION: Velocity of**
- CENTNERSZWER, M. [Velocity of solution of metals. I. Review of the literature.] J. Russ. Phys. Chem. Soc. 47: 1064-1086 (1915). "Exhaustive review with complete bibl."
- CENTNERSZWER, M., and SACHS, J. Ueber die Lösungsgeschwindigkeit der Metalle in Säuren. I. Die Lösungsgeschwindigkeit des Zinks. Z. physik. Chem. 87: 692-762 (1914). Bibl. footnotes.
- SOLVENT RECOVERY**
- ROBINSON, CLARK S. The recovery of volatile solvents. New York, Chem. Cat. Co., 1922. 183 p. Chronological bibl.
- WORDEN, E. C. Solvent recovery. In *his* Technology of cellulose esters 1: 2553-2558 (1921). Bibl. footnotes.
- SOLVENTS**
- FISCHER, E. J. Neuere Lösungsmittel für Harze und Lacke, Zelluloseester, Kautschuk, usw. Kunststoffe 6: 210-212, 225-229, 244-246, 259-261 (1916). Patented solvents.
- HALBAN, HANS v. Die Rolle des Lösungsmittels in der chemischen Kinetik. Z. physik. Chem. 67: 129-182 (1909). Bibl. footnotes.
- WALDEN, P. Ueber organische Lösungs- und Ionisierungsmittel. V. Lösungsvermögen. Z. physik. Chem. 55: 683-720 (1906). Bibl. footnotes.
- WALDEN, P. Ausdehnungsmodulus, spezifische Kohäsion, Oberflächenspannung und Molekulargröße der

SOLVENTS—Cont'd

Lösungsmittel. *Z. physik. Chem.* 65: 129-225 (1908-1909). *Bibl. footnotes.*

See also SULFUR DIOXIDE (Walden).

SOMATOSE

"Somatose." *Ind.-Cat. S. G. O.*, 2nd Ser., 16: 171-172 (1911).

SOMNOFORM

"Somnoform." *Ind.-Cat. S. G. O.*, 2nd Ser., 16: 177-178 (1911).

SORBITOL

MEYER-JACOBSON. Sorbit. *In their* Lehrb. org. Chem. 1, pt. 2: 187 (1917). 25 references.

See also SUGAR ALCOHOLS.

SORBOSE

NEUBERG, C., and REWALD, B. *d*-Sorbinose. *In* Abderhalden, *Biochem. Handl.* 2: 370-372 (1911); 8: 185-186 (1914). *Bibl. footnotes.*

See also CARBOHYDRATES.

SORGHUM

COLLIER, PETER. Sorghum, its culture and manufacture economically considered as a source of sugar, syrup and fodder. Cincinnati, Clarke, 1884. 570 p. *Bibl.*, p. 42-49.

NATIONAL ACADEMY OF SCIENCES. Investigation of the scientific and economic relations of the sorghum sugar industry, being the report made in response to a request from the Hon. George B. Loring, U. S. Commissioner of Agriculture, by a committee of the National Academy of Sciences, Nov., 1882. 152 p. *Bibl.*, p. 148-152.

See also SUGAR.

SOY BEAN

BOWERS, W. G. Some studies on the nutritive value of the soy bean in the human diet. North Dakota Agr. Expt. Sta., Special Bull. 5, No. 13, p. 278-328 (1919). 65 references.

CHURCH, MARGARET B. Soy and related fermentations. U. S. Dept. Agr., Bull. No. 1152, 1923. 27 p. *Bibl.*, p. 25-26.

HONCAMP, F. Die Sojahohne und ihre Abfallprodukte. *Landw. Vers. Stat.* 73: 284 (1910).

PIPER, CHARLES V., and MORSE, WM., J. The soy bean. New York, McGraw Hill, 1923. 329 p. *Bibl.*, p. 288-310.

See also LACTOSE (Beltzer).

SOY BEAN OIL

TAVERNE, NICOLAAS J. A. De oxydatie en de polymerisatie van sojaolie. Thesis, Delft, 1913. 102 p. *Bibl.*, p. 3-7.

See also FATS, OILS, WAXES.

SPARTEINE

SCHMIDT, JULIUS. Spartein. *In* Abderhalden, *Biochem. Handl.* 5: 114-117 (1911). *Bibl. footnotes.*

"Sparteine." *Ind.-Cat. S. G. O.*, 1st ser., 13: 355-356 (1892); 2nd ser., 16: 208 (1911).

See also ALKALOIDS.

SPECIFIC GRAVITY. See DENSITY.**SPECIFIC HEAT**

CLARKE, FRANK W. A table of specific heats for solids and liquids. Constants of Nature, pt. II. Smithsonian Misc. Coll., No. 276. 1876. 57 p. *Bibl.*, p. 5-7. 46 references.

EUCKEN, A. Neuere Untersuchungen ueber den Temperaturverlauf der spezifischen Wärme. *Jahrb. Radioakt. Elektronik* 8: 489-493 (1911). 77 references.

LANDOLT-BÖRNSTEIN. Spezifische Wärme. *In their* Tabellen, 4th ed., 1912, 777-785; 5th ed., 1923, 1281-1288.

MELLOR, J. W. Specific heats of elementary solids. Dulong and Petit's rule. *In his* *Inorg. theor. chem.* 1: 798-805 (1922). 100 references.

MURAOUR, H. La variation de la chaleur spécifique des gaz avec la température d'après les travaux les plus récents. *Chimie & industrie* 10: 29 (1923). 50 references.

SCHULZ, KARL. Die spezifische Wärme der Mineralen und der künstlich hergestellten Stoffe von entsprechender Zusammensetzung. Fortschritte Mineral. Krist. Petr. 2: 259-304 (1912); 3: 273-320 (1913). 109 references.

TABLES ANNUELLES. Chaleur spécifique. 1: 50-59 (1910); 2: 43-50 (1911); 3: 51-56 (1912); 4: 139-152 (1913-1916). References to all numerical data reported during those years.

WIGAND, ALBERT. Neuere Untersuchungen ueber spezifische Wärmen. *Jahrb. Radioakt. Elektronik* 10: 54-59 (1913). 88 references.

See also GASES.

SPECIFICATIONS

MEAD, DANIEL W. Contracts, specifications and engineering relations. New York, McGraw, 1920. *Bibl.*, p. 485-535.

SPECTRA. See SPECTROSCOPY.**SPECTROSCOPE**

BAKER, T. THORNE. The spectroscope and its uses in general analytical chemistry. 2nd ed. New York, Wood, 1923. 208 p. *Bibl. footnotes.*

TUCKERMAN, ALFRED. Index to the literature of the spectroscope. Smithsonian Inst. Pub. No. 658, 1888. 423

p. 3829 references. Supplement, covering 1887-1900, issued as Pub. No. 1312, 1902.

SPECTROSCOPY

- BALY, E. C. C. *Spectroscopy*. New York, Longmans, 1918. 687 p. Bibl. footnotes. 3rd ed., 1924. Vol. 1, 310 p. Bibl. footnotes.
- CHWOLSON, O. D. *Zerstreuung (Dispersion) der strahlenden Energie*. In *his* *Lehrbuch der Physik*, 2nd ed., 2, pt. 2: 391-396 (1922).
- COBLENTZ, W. W. Bericht ueber den Zusammenhang zwischen chemischer Konstitution und ultraroten Absorptionsspektren. *Jahrb. Radioakt. Elektronik* 4: 7-77 (1907). Bibl. footnotes.
- DOBBIE, J. J., BALY, E. C. C., and STEWART, A. W. List of organic compounds, the absorption spectra of which have been measured in the visible and ultraviolet. *Rept. Brit. Assoc. Adv. Sci.*, 1916: 131-186 (1917); 1920: 244-247 (1921); 1922: 294-313. Compounds arranged alphabetically with references.
- EISENLOHR, FRITZ. *Spektrochemie organischer Verbindungen*. Stuttgart, Enke, 1912. 222 p. Bibl. footnotes.
- HARTLEY, WALTER N. Beziehungen zwischen Absorption und Constitution organischen Körper. In *Kayser's Handb. der Spectroscopie* 3: 149-314 (1905). Bibl. footnotes.
- HILGER, ADAM, LTD. Bibliography concerning the chemical significance of absorption spectra (Organic compounds and the rare earths). In *their* *Catalog on Spectrophotometers for the ultraviolet, visible and infrared regions*, Oct., 1920. 14 p. Classified bibl. up to June, 1920.
- JONES, HARRY C., and ANDERSON, JOHN A. The absorption spectra of solutions of certain salts of cobalt, nickel, copper, iron, chromium, neodymium, praseodymium and erbium in water, methyl alcohol, ethyl alcohol and acetone and in mixtures of water with the other solvents. *Carnegie Inst., Pub. No. 110*. Washington, 1909. 110 p. Bibl. footnotes.
- JONES, HARRY C., and STRONG, W. W. The absorption spectra of solutions of comparatively rare earths. *Carnegie Inst., Pub. No. 106*. Washington, 1911. 112 p. Bibl. footnotes.
- JONES, HARRY C., and STRONG, W. Study of the absorption spectra of solutions of certain salts of potassium, cobalt, nickel, copper, chromium, erbium, praseodymium, neodymium and uranium as affected by chemical agents and by temperature.

Carnegie Inst., Pub. No. 130. Washington, 1910. 159 p. Bibl. footnotes and 34 references, p. 145-146.

- KAYSER, H. *Handbuch der Spektroskopie*. Leipzig, Hirzel, 1901-1912. 6 vols. Vol. 7, bringing the data up to about 1920, is appearing in parts, beginning 1923. Bibl. of the spectra of each element given in vols. 5-7.
- KROLLPFEIFFER, F. *Spektrochemische Untersuchungen an mehrkernigen aromatischen Verbindungen in Lösungen*. *Ann.* 430: 161-229 (1923). 125 footnotes.
- LEY, H. Ueber die Beziehungen zwischen Lichtabsorption und chemischer Konstitution bei organischen Verbindungen. *Jahrb. Radioakt. Elektronik* 6: 274-380 (1909). Bibl. footnotes.
- LEY, H. Absorptionspektren anorganischer und organischer Verbindungen. *Fortschritte Chem.* 9: 15-26 (1914); 10: 313-318 (1914-1915); 11: 11-28 (1915-1916). References through text.
- MCLEOD, H. Bibliography of spectroscopy. *Rept. Brit. Assoc. Adv. Sci.* 1881: 329-423; 1884: 295-350; 1889: 344-422; 1894: 161-236; 1898: 439-519; 1901: 155-208. Classified.
- RUDORF, G. Die Lichtabsorption in Elektrolyten. *Jahrb. Radioakt. Elektronik* 3: 422-425 (1907); 4: 380-382 (1908). 183 references.
- SIEGBAHN, MAUNE. Bericht ueber die Röntgenspektren der chemischen Elemente. *Jahrb. Radioakt. Elektronik* 13: 296-300 (1916). 66 references.
- "Spectroscopy." *Ind.-Cat. S. G. O.*, 1st ser., 13: 365-366 (1892); 2nd ser., 16: 223 (1911).
- "Spectrum analysis." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 223-224 (1911).
- STARK, J. Bericht ueber die Träger der Spektren der chemischen Elemente. *Jahrb. Radioakt. Elektronik* 14: 140-147 (1917). 146 references.
- TWYMAN, F. *Wavelength tables for spectrum analysis*. London, Hilger, 1923. 106 p. Bibl., p. 100-106.
- YNTEMA, L. F. Observations on the rare earths. XIII. Studies on the absorption spectra. *J. Am. Chem. Soc.* 45: 907-915 (1923). 46 footnotes.
- SPERMATOZOA**
- BURIAN, RICHARD. *Chemie der Spermatozoen*. *Ergeb. Physiol.* 3: 48-52 (1904); 5: 769-773 (1906). 209 references.

SPICES

RICHARDSON, CLIFFORD. Bibliography of the literature of spices and condiments. *In* U. S. Dept. Agr., Bur. Chem., Bull. No. 13, pt. 2: 235-238 (1887).

SPLEEN

EDDY, NATHAN B. Internal secretions of the spleen. *Endocrinology* 5: 461-475 (1921). 49 references.

See also SECRETIONS.

SPUTUM

FALK, FRITZ. Zur Chemie des Sputums. *Ergeb. Physiol.* 9: 406-408 (1908). 75 references.

PLESCH, JOHANN. Chemie des Sputums. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 7-19 (1910). 42 footnotes.

STACHYDRINE. *See* CHOLINE.**STANDARD CELLS**

COHEN, ERNST, CHATTAWAY, E. D., and TOMBROCK, W. Zur Thermodynamik der Normalelemente. *Z. physik. Chem.* 60: 706-727 (1907). 50 footnotes.

JAEGER, W. Die Normalelemente. Halle, Knapp. 1902. 131 p. Bibl., 1, p. 119-123.

MELLON, M. G., and HENDERSON, W. E. Lead standard cell. *J. Am. Chem. Soc.* 42: 676 (1920). 30 footnotes.

"Neue Elemente." *Elektrochem. Z.* 21: 159-167 (1914-1915). 60 references.

STANNIC CHLORIDE

SCHLENK, O. Stannichlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 308-321, 343-346, 985-987 (1911).

STANNIC OXIDE

HENGLEIN, M. Zinnoxid (SnO_2). *In* Doelter, Handb. Mineralchem. 3, pt. 1: 177-189 (1918). Bibl. footnotes.

SCHLENK, O. Stannioxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 271-285, 977-980 (1911).

STANNIC SULFIDE

SCHLENK, O. Stannisulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 291-295 (1911).

STANNOUS CHLORIDE

SCHLENK, O. Stannoehlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 302-308, 984-985 (1911).

STANNOUS OXIDE

SCHLENK, O. Stannooxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 264-271, 976-977 (1911).

STANNOUS SULFIDE

SCHLENK, O. Stannosulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 287-290 (1911).

STARCH

CZAJEK, F. Stärke. *In* his *Biochemie der Pflanzen*, 3rd ed., 397-417, 420-442, 461, 473-485 (1922). Bibl. footnotes.

KUTSCHER, R. [Estimation of starch.] *Wochschr. Brau.* 34: 277, 290, 294, 304, 313, 323, 332, 339, 349, 359, 368, 375, 381, 391, 398, 406 (1917). Bibl. footnotes.

MEYER-JACOBSON. Stärke. *In* their *Lehrb. org. Chem.* 1, pt. 2: 1027-1033 (1913). Bibl. footnotes.

OELKER, A. Tabellarische Zusammenstellung in- und ausländischer Patente betr. die Herstellung löslicher Stärke u. Dgl. *Kunststoffe* 6: 189-191 (1916). 44 patents.

RASK, O. S., and ALSBERG, C. L. A viscometric study of wheat starches. *Cereal Chem.* 1: No. 1 (1924); Thesis, Leland Stanford Jr. Univ., 1924. 25 p. Bibl., p. 25-26.

REICHERT, EDWARD T. The differentiation and specificity of starches in relation to genera, species, etc. Carnegie Inst., Pub. No. 173. Washington, 1913. Bibl. through text of first 163 p.

SAARE, O. Die Fabrikation der Kartoffelstärke. Berlin, Springer, 1897. Bibl., p. 536-567. Classified by subjects and includes patents.

"Starch." *Ind.-Cat. S. G. O.*, 1st ser., 13: 563-564 (1892); 2nd ser., 16: 485 (1911).

THOMAS, ARTHUR W. The chemical constitution of starch. *Biochem. Bull.* 4: 379-397 (1915). 29 footnotes.

WORDEN, E. C. Starch. *In* his *Technology of cellulose esters*, 1: 389-484. 6583 references, including patents.

ZEMPLÉN, GÉZA. Stärke (Amylum). *In* Abderhalden, *Biochem. Handl.* 2: 114-154 (1911); 8: 22-39 (1914). About 1000 footnotes.

See also CARBOHYDRATES.

STARCH IODIDE

ANDREWS, L. W., and GOETTSCH, H. M. Starch iodide. *J. Am. Chem. Soc.* 24: 865-881 (1902). 50 references.

DHAR, N. R. The starch-iodide reaction. *J. Phys. Chem.* 28: 125-130 (1924). 22 references.

STEARIC ACID

SCHMIDT, E. Stearinsäure. *In* Abderhalden, *Biochem. Handl.* 1: 1008-1015 (1911). About 100 footnotes; includes derivatives.

See also FATS, OILS, WAXES.

STEEL

BURNHAM, THOMAS H. Special steels. London, Pitman, 1923. 194 p. Bibl., p. 166-183. 135 references.

- BURROWS, CHARLES W. Correlation of the magnetic and mechanical properties of steel. U. S. Bur. Stand., Sci. Paper No. 272, 1916. Bibl., p. 209-210. 77 references, 1841-1914.
- GILLETTE, H. W. Possibilities in the application of colloid chemistry to the production of clean steel. Trans. Am. Inst. Mining Met. Eng., 69: 768-774 (1923). 44 references.
- HATFIELD, WM. H. Special steels. In Glazebrook, Dictionary of Applied Physics, 5: 515-559 (1923). Bibl. footnotes.
- HIBBARD, HENRY D. Manufacture and uses of alloy steels. U. S. Bur. Mines, Bull. No. 100, 1915. 74 p. References on tungsten, chromium, manganese, nickel, silicon and high speed tool steels.
- MARS, G. Die Spezialstähle. 2nd ed. Stuttgart, Enke, 1922. 675 p. Bibl. footnotes.
- PORTEVIN, ALBERT M. Study of the special ternary steels. Iron Steel Inst., Carnegie Scholarship Mem. 1: 362-364 (1909).
- SCOTT, H. Effect of rate of temperature change on transformation in an alloy steel. Bull. Am. Inst. Mining Eng. No. 146 (1919). 22 references, supplementing Yatsevitch.
- VANICK, J. S. Mechanical properties of some chrome-vanadium steels. Trans. Am. Soc. Steel Treating 3: 217 (1922). 23 references.
- VANICK, J. S., and SVESHNIKOFF, W. W. Thermal transformations in some chrome-vanadium steels. Trans. Am. Soc. Steel Treating 3: 533 (1923). 20 references.
- YATSEVITCH, M. Recherches sur l'acier a coupe rapide. Rev. métal. 15: 109-115 (1918).
- See also IRON, IRON ALLOYS.*
- STEEL: Analytical.**
- BREARLY, HARRY. Bibliography of steel works analysis. In his The analysis of steel-works materials, 1902, p. 305-315. *Also in* Chem. News, v. 80-85 (1899-1902).
- HURUM, FREDERIK, and FAY, HENRY. Determination of nitrogen in steel. Chem. Met. Eng. 26: 218-222 (1922).
- KOPF, ALFRED. Beiträge zur Qualitäts Stahlanalyse. I. Kohlenstoff. Z. angew. Chem. 36: 192-197, 205-209 (1923). 82 footnotes.
- MÜLLER, ERICH, and DIETHELM, B. Die Bestimmung des Kohlenstoffs und Schwefels in den hochprozentigen Legierungen des Wolframs, Molybdäns und Vanadiums mit Eisen. Z. angew. Chem. 23: 2123-2124 (1910). 79 footnotes.
- PULSIFER, H. B. Determination of sulfur in iron and steel. Easton, Chem. Pub. Co., 1922. 160 p. Bibl., p. 53-155. Covers 1797-1916. *In part in* J. Ind. Eng. Chem. 8: 1119-1123 (1916).
- TOWNSEND, A. S. Rapid method for the determination of chromium in steel. Forging Heat Treating 8: 304-305 (1922).
- See also ANALYTICAL CHEMISTRY.*
- STEEL: Boron.**
- HANNESSEN, GERHARD. Ueber Borstähle. Z. anorg. Chem. 89: 257-278 (1914). Bibl. footnotes.
- STEEL: Carbon.**
- AUSTIN, C. R. Hydrogen decarburization of carbon steels with considerations of related phenomena. J. Iron Steel Inst. 105: 141-142 (1922). 39 references.
- BENEDICT, CARL. Recherches physiques et physico-chimiques sur l'acier au carbone. Dissertation, Upsala, 1904. 219 p. Bibl., p. 210-215.
- BERGGREEN, P. H. Bibliography of the different forms and combinations of carbon with iron, including those in iron alloys. Bull. Am. Inst. Mining Eng., No. 90: 913-927 (1914). 350 references.
- HALLIMOND, A. F. Delayed crystallization in the carbon steels. Trans. Am. Soc. Steel Treating 3: 942-943 (1923); J. Iron Steel Inst. 105, 377-378 (1922). 32 references.
- KRÖHNKE, O. Kurze Einführung in den inneren Gefügebau der Eisenkohlenstofflegierungen. Berlin, 1911. 121 p. Bibl., p. 75-110.
- LANGDON, S. C., and GROSSMAN, M. A. The embrittling effects of cleaning and pickling upon carbon steels. Trans. Am. Electrochem. Soc. 38: 543-578 (1920). 25 footnotes.
- SCHAFER, RUDOLF. Der Stahlguss als Werkstoff. Giesserei-Ztg. 19: 482 (1922). 64 footnotes.
- WUST, F. Ueber die Entwicklung der Zustandsdiagramme des Eisen-Kohlenstofflegierungen. Metall. 6: 529-531 (1909). 50 references.
- STEEL: Cerium.** *See* STEEL, MOLYBDENUM.
- STEEL: Copper.**
- CLEVENGER, G. H., and RAY, B. The influence of copper upon the physical properties of steel. Trans. Am. Inst. Mining Eng. 47: 557-561 (1913); Bull. No. 82: 2471-2475 (1913). 47 annotated references.
- STEEL: Chromium.**
- ZIMMERLI, F. P. Bibliography and abstracts of chromium steel. Chem. Met. Eng. 25: 837-843 (1921). 115 references. 1798-1919.

STEEL: Gases in.

HATFIELD, ROBERT. The occlusion of gases in metals. *Trans. Faraday Soc.* 14: 173-191 (1919). 73 references.

STEEL: High speed.

Bibliography of high-speed tool steels. *Trans. Am. Soc. Steel Treating* 3: 47-89 (1923). About 360 annotated references, covering 1900-1924. Includes manufacture, heat treatment, uses and tests.

MATHEWS, JOHN A. Selected bibliography of high speed tool steel. *Proc. Am. Soc. Testing Materials* 19, pt. 2: 154-155 (1919). 35 references.

PULSIFER, H. B. The microscopic structure of high-speed steels. *Chem. Eng.* 21: 120-121 (1915). 20 references.

See also STEEL (Yatsevitch).

STEEL: Manganese.

COE, H. I. Manganese and its effects on iron and steel. *Straffordshire Iron Steel Inst.* 25: 15-17.

HADFIELD, R. A. Manganese steels. *In* Glazebrook, Dictionary of Applied Physics 5: 571-572 (1923).

HOPKINSON, B. Research with regard to the non-magnetic and magnetic conditions of manganese steels. *Trans. Am. Inst. Mining Eng.* 50: 494-496 (1914). Chronological, 1875-1914.

MCCLELLAND, E. H. Bibliography of manganese steel. *Blast Furnace Steel Plant* 10: 548-552 (1924). Annotated.

See also IRON ALLOYS (Levy); STEEL (Hubbard).

STEEL: Molybdenum.

GILLET, H. W., and MACK, E. L. Molybdenum, cerium and related alloy steels. *New York, Chem. Cat. Co.*, 1924. Bibl., p. 268-277. 311 references.

HADFIELD, ROBERT A. Alloys of iron and molybdenum. *Proc. Inst. Mech. Eng.*, 1915, 2: 712-713.

STEEL: Nickel.

COLBY, A. L. Comparison of certain physical properties of nickel steel and carbon steel proving the superiority of nickel steel over carbon steel for bridge and structural purposes. *New York, International Nickel Co.*, 1903. Bibl. at end of chapters.

GUTHRIE, A. Nickel und Eisen. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 1: 179-185 (1909).

HANSON, D., and HANSON, HILDA E. The constitution of the nickel iron alloys. *J. Iron Steel Inst.* 102: 59-60 (1920); *Collected Researches, Na-*

tional Physical Lab. 16: 252-253 (1921). 25 references.

U. S. Bureau of Standards. Invar and related nickel steels. *Circular No. 58*. 2nd ed. 1923. 93 p. Selected bibl., p. 92-93.

WATERHOUSE, G. B. The influence of nickel and carbon on iron. *J. Iron Steel Inst.* 68: 376 (1905).

See also NICKEL (U. S.).

STEEL: Nitrogen.

COMSTOCK, G. F., and RUDER, W. E. Effect of nitrogen on steel; a résumé of the important literature. *Chem. Met. Eng.* 32: 399-405 (1920).

STEEL: Phosphorus.

U. S. Bureau of Standards. Phosphorus and sulfur in steel. A bibliography of the action of phosphorus and sulfur in steel. Washington, 1921.

STEEL: Pickling. *See* IRON, PICKLING.

STEEL: Silicon.

SCHWARZ, M. v. Ferrosilizium. *Ferrium* 11: 80-90, 112-117 (1913-1914). Bibl. footnotes; bibl., p. 114-115.

STEEL: Stainless.

DAEVES, KARL. Rostfreie Stähle. *Stahl u. Eisen* 42: 1320 (1922). 32 references.

POLANSKY, VICTOR S. Bibliography of stainless steel. *Forging Heat Treating* 8: 560-565 (1922). 170 references.

POLANSKY, VICTOR S. Stainless steel and stainless iron. *Carnegie Library of Pittsburgh*, 1923. 21 p. 200 references.

"Stainless steel." *Mech. Eng.* 44: 469 (1922). 22 references.

STEEL: Tungsten.

HULTGREN, AXEL. [Metallographic study of tungsten steel.] *Jerkonterets Annaler* 105: 499-525 (1921).

See also STEEL (Hubbard).

STEEL: Uranium.

GILLET, H. W., and MARK, E. L. Preparation of ferrouanium. *U. S. Bur. Mines, Tech. Paper No. 177*, 1917. 46 p. Bibl. footnotes.

STEREOCHEMISTRY

BISCHOFF, C. A. *Materialien der Stereochemie*. Braunschweig, Vieweg, 1904. 2 vols., covering 1894-1898 and 1899-1902. Bibl. footnotes.

BISCHOFF, C. A., and WALDEN, PAUL. *Handbuch der Stereochemie*. Frankfurt, Bechhold, 1894. 1060 p. Classified by compounds, with references.

CHEMICAL SOCIETY. *Stereochemistry*. *In* Annual reports on the progress of chemistry, 1-5 (1904-1909). Bibl. footnotes.

- DELÉPINE, MARCEL. La theorie du carbone asymétrique. *Bull. soc. chim.* (4) 37: 197-233 (1925). 114 footnotes and references.
- EIOLART, ARNOLD. An index to the literature of stereochemistry. *J. Am. Chem. Soc.* 14: 241-286 (1892). Reprinted as separate, 1893. 96 p. *Bibl.*, p. 54-94. 340 references.
- LANDAU, B. Stereochemie und optisches Drehungsvermögen. *Fortschritte Chem.* 4: 25-33 (1911); 5: 221-241 (1912); 10: 61-74 (1914-1915). References through text.
- MARCKWALD, W. Stereochemie und optisches Drehungsvermögen. *Fortschritte Chem.* 1: 261-268 (1909); 3: 105-113 (1910-1911).
- MICHAEL, A. Stereoisomers and the law of entropy. *Am. Chem. J.* 39: 1-16 (1908). 50 footnotes.
- PFEIFFER, P. Beitrag zur Stereochemie der Kohlenstoffverbindungen, speziell der ungesättigten Systeme. *Z. physik. Chem.* 48: 40-62 (1904). 60 footnotes.
- WALDEN, P. [Stereochemistry.] *Chem. Weekblad* 22: 34-61 (1925). 262 references.
- WEDEKIND, E. Development of the stereochemistry of the pentavalent nitrogen in the last nine years. *Ion* 1: 116-136 (1908). 87 footnotes.
- STEROLS.** See CHOLESTEROL.
- STIBINE**
- EPHRAIM, F. Stibin. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 667-677 (1908).
- STOICHIOMETRY**
- KREMANN, R. Stöchiometrie. *Fortschritte Chem.* 2: 107-121, 375-390 (1910); 3: 265-282 (1910-1911); 4: 265-277 (1911); 5: 61-74 (1912); 6: 1-16, 333-348 (1913); 7: 9-25 (1913); 9: 73-94 (1914-1915); 11: 269-277 (1915-1916). References through text.
- See also ANALYSIS, CHEMISTRY.
- STOMACH**
- BICKEL, A. Magen- und Magensaft. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 2: 1-10 (1910). 100 footnotes.
- ISAAC, H. Die Untersuchung, W. Die Ursubstanz des Mageninhaltes. *In* Oppenheimer, *Handb. biol. Arch.* 6: 411-464 (1923). 100 footnotes.
- LUDWIG, Neuere Ergebnisse, dem Gebiete der Magen- secretion. *Ergeb. allem. Path.* 2: 584-591 (1909). 185 references.
- "Stomach, acids of." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 622-630 (1911).
- "Stomach, contents of, examination of." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 660-667 (1911).
- "Stomach, gases in." *Ind.-Cat. S. G. O.*, 1st ser., 13: 751 (1892); 2nd ser., 16: 710-711 (1911).
- "Stomach, physiology of." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 734-738 (1911).
- "Stomach, secretion of." *Ind.-Cat. S. G. O.*, 1st ser., 13: 766-767 (1892); 2nd ser., 16: 740-744 (1911).
- ZUNZ, EDGARD. Über Abbau und Resorption der Nahrungsstoffe im Magen. *Biochem. Centr.* 2: 297-302, 349-356 (1903). 90 references.
- See also DIGESTION, GASTRIC JUICE.
- STORAGE BATTERIES**
- MAYNARD, GEORGE S. List of works relating to storage batteries, 1900-1915. *Bull. N. Y. Public Library* 19: 365-399 (1915). 630 references, chronological, with author and subject index.
- VINAL, GEORGE W. Storage batteries; a general treatise on the physics and chemistry of secondary batteries and their engineering applications. New York, Wiley, 1924. 402 p. Contains bibls.
- STOVAINE**
- "Stovaine." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 815-817 (1911).
- See also ALKALOIDS.
- STRAMONIUM**
- "Stramonium." *Ind.-Cat. S. G. O.*, 2nd ser., 16: 829-830 (1911).
- STRAW**
- THOMANN, WALTER. Vergleichende Versuche über die Zusammensetzung und Verdaulichkeit von Rohstroh und aufgeschlossenem Stroh. Dissertation, Zürich, 1921. 58 p. *Bibl.*, p. 56-57.
- See also CELLULOSE, FIBERS, PAPER.
- STRONTIUM**
- COPAU, H. Strontium. *In* Moissan, *chim. min.* 3: 590-622 (1904). 177 footnotes.
- EPHRAIM, FRITZ. Strontium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 2, pt. 2: 125-187 (1909).
- GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Strontium minerals. (1913-1919.) London, 1923. 12 p. *Bibl.*, p. 11-12.
- SACKUR, OTTO. Strontium. *In* Abegg, *Handb. anorg. Chem.* 2, pt. 2: 232-236 (1905). 233 references.
- "Strontium and salts." *Ind.-Cat. S. G. O.*, 1st ser., 13: 824 (1892); 2nd ser., 16: 858-859 (1911).
- See also ALKALINE EARTHS (Mellor).

STRONTIUM BROMIDE

EPHRAIM, FRITZ. Strontiumbromid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 162-163 (1909).

See also ALKALINE EARTHS (Mellor).

STRONTIUM CARBONATE

EPHRAIM, FRITZ. Strontiumcarbonat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 177-179 (1909).

LEITMEIER, H. Strontiumcarbonat. In Doelter, Handb. Mineralchem. 1: 480-489 (1912). Bibl. footnotes.

See also ALKALINE EARTHS (Mellor).

STRONTIUM CHLORIDE

EPHRAIM, FRITZ. Strontiumchlorid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 155-159 (1909).

See also ALKALINE EARTHS (Mellor).

STRONTIUM IODIDE

EPHRAIM, FRITZ. Strontiumjodid. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 164-166 (1909).

See also ALKALINE EARTHS (Mellor).

STRONTIUM NITRATE

EPHRAIM, FRITZ. Strontiumnitrat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 140-143 (1909).

See also ALKALINE EARTHS (Mellor).

STRONTIUM SULFATE

EPHRAIM, FRITZ. Strontiumsulfat. In Gmelin-Kraut, Handb. anorg. Chem. 2, pt. 2: 147-150 (1909).

See also ALKALINE EARTHS (Mellor).

STROPHANTHUS

BRAUNS, D. H., and CLOSSEN, O. E. On crystalline Kombi's strophanthin. J. Am. Pharm. Assoc. 2: 604-618, 715-724, 843-851 (1912). Bibl. footnotes; bibl., p. 851. Arch. Pharm. 252: 339-340 (1914). 38 references.

EULER, H., and LUNDBERG, J. Strophanthin. In Abderhalden, Biochem. Handl. 2: 688-691 (1911). Bibl. footnotes.

GILG, E., THOMS, H., and SCHEDEL, H. Die Strophanthus-frage von botanisch-pharmakognostischem, chemischem und pharmakologisch-klinischem Standpunkte. Reprinted from Ber. pharm. Ges., 1904. 48 p. Bibl., p. 46-48.

"Strophanthine." Ind.-Cat. S. G. O., 1st ser., 13: 824-826 (1892); 2nd ser., 16: 859-860 (1911).

ZEMPLÉN, GÉZA. Strophanthin. In Abderhalden, Biochem. Handl. 10: 882-888 (1923).

STRYCHNINE

SCHMIDT, JULIUS. Strychnin. In Abderhalden, Biochem. Handl. 5: 165-178 (1911). 50 footnotes.

SCHWARTZE, ERICH W. The relative toxicity of strychnine to the rat. U. S. Dept. Agr., Bull. No. 1023, 1922. 19 p. Bibl., p. 18-19. 30 references.

"Strychnine." Ind.-Cat. S. G. O., 1st ser., 13: 830-838 (1891); 2nd ser., 16: 864-870 (1911).

See also ALKALOIDS.

STYRENE

BAUM, FRITZ. Styrol (Phenyläthylene). In Abderhalden, Biochem. Handl. 1: 319-326 (1911). 100 footnotes (includes derivatives).

See also HYDROCARBONS.

SUBERIC ACID

MEYER-JACOBSON. Korksäure. In their Lehrb. org. Chem. 1, pt. 2: 403 (1913). 50 references.

SUBERIN

ZEMPLÉN, GÉZA. Korksubstanz (Suberin). In Abderhalden, Biochem. Handl. 2: 245-247 (1911); 8: 83-84 (1914). 60 footnotes.

See also CORK.

SUBLAMIN

"Sublamin." Ind.-Cat. S. G. O., 2nd ser., 17: 2-3 (1912).

SUBLIMATION

KEMPF, RICHARD. Praktische Studien ueber Vakuum-sublimation. J. prakt. Chem. 186: 201-259 (1908). Bibl. footnotes.

SUCCINIC ACID

MEYER-JACOBSON. Bernsteinsäure. In their Lehrb. org. Chem. 1, pt. 2: 355-380 (1913). Bibl. footnotes.

THIELE, A. Bernsteinsäure. In Abderhalden, Biochem. Handl. 1: 1127-1136 (1911). 225 footnotes (includes derivatives).

SUGAR

Catalogue des ouvrages spéciaux de langue française concernant le sucre et l'industrie sucrière. Paris, 1911. 340 p. Catalog of the French works in the library of L. S. Ware.

CLAASSEN, H. Die Zuckerfabrikation in der mit besonderer Berücksichtigung des Betriebes. Magdeburg. Schallehn, 1901. 335 p. Bibl., p. 332-335. English edition. New York, Wiley, 1906. 280 p. Bibl., p. 276-280.

CLAASSEN, H. Fortschritte in der Rübenzuckerfabrikation, 1906-1908. Z. angew. Chem. 22: 1201-1205 (1909). 44 footnotes.

DEERR, NOEL. Cane sugar. 2nd ed. London, Rodger, 1921. 644 p. Bibl., p. 591-604. 300 references. Classified.

ELLIS, ELLEN D. An introduction to the history of sugar as a commodity. Bryn Mawr College Mon. No. 4, 1905. 117 p. 100 references, p. 113-117.

GRÖGER, A. Chemisch-technisches Vademekum für Zuckerfabriken. 3 vols. 1901, 573 p.; 1906, 344 p.; 1911,

- 697 p. Covers the literature from 1851 to 1910.
- Katalog der deutschen Abteilung einer Special-Bibliothek des Herrn L. S. Ware ueber die Zuckerindustrie. Courbevoie, France. 33 p. Lists 550 volumes in the German language.
- Katalog der Werke ueber Zucker und Zuckerindustrie. Locarno, 1914. 70 p. Lists about 900 volumes, covering all languages.
- LIPPMANN, EDMUND, O. v. Geschichte des Zuckers, seine Darstellung und Verwendung, seit den ältesten Zeiten bis zum Beginne des Rübenzuckerfabrikation. Leipzig, Hesse, 1890. 474 p. Bibl., p. 447-457.
- MEYER, HERMANN H. H. Select list of references on sugar, chiefly in its economic aspects. Library of Congress, 1910. 204 p. 1909 references, classified. Mimeographed supplement of 388 titles issued July 31, 1917.
- NEWLAND, JOHN A. R. Sugar: a handbook for planters and refiners. New York, Spon, 1909. 876 p. Bibl., p. xxv-xxxvi.
- ROTH, H. LING. A guide to the literature of sugar. Books of reference for chemists, botanists, librarians, manufacturers and planters, with a comprehensive subject index. London, Kegan Paul, 1890. 159 p. About 1200 titles.
- SCHONEBAUM, CAREL W. Ozonisieren van fabrieksproducten der suikerindustrie. Dissertation, Delft, 1921. 87 p. Bibl., p. 7-16.
- SOCIETY OF CHEMICAL INDUSTRY. Sugars, starches and gums. *In* Reports of the progress of applied chemistry 2: 375-404 (1917); 3: 362-385 (1918); 4: 377-402 (1919); 5: 389-417 (1920); 6: 418-445 (1921); 7: 384-413 (1922); 8: 432-455 (1923); 9: 451-474 (1924). Bibl. footnotes.
- SPENCER, GUILFORD. Handbook for cane sugar manufacturers. New York, Wiley, 1916. 520 p. Bibl., p. 500-517, 622 references.
- SPENCER, G. L. Sugar. *In* Rogers, Manual of industrial chemistry, 3rd ed., 915-917. Selected.
- VILLAVECCHIA, V., and ROSSI, G. Rivista dei progressi dell'industria dello zucchero nell'anno 1913-1914. Ann. chim. appl. 2: 36-47 (1914); 110 footnotes. 4: 270-283 (1915); 160 footnotes.
- WALLIS-TAYLER, ALEXANDER J. Sugar machinery; a descriptive treatise devoted to the machinery and processes used in the manufacture of cane and beet sugars. London, Rider, 1924. 428 p. Bibl., p. 398-400.
- Serial*
- International sugar journal. 1899- . "Review of current technical literature" in each number.
- Jahresbericht über die Untersuchungen und Fortschritte auf dem Gesamtgebiete der Zuckerfabrikation. 1861- . Contains bibl. footnotes; also a list of patents with annotations. *See also* CARBOHYDRATES, names of individual sugars.
- SUGAR: Adulteration.**
- COLBY, ALBERT L. Bibliography on the adulteration and examination of sugars, sirups, molasses, glucose, confectionery, honey and soda water sirups. *In* 2nd Annual Rept., State Board of Health, N. Y., 1882: 613-618.
- SUGAR: Analytical.** *See* CARBOHYDRATES—ANALYTICAL.
- SUGAR: Deterioration.**
- KOPELOFF, N. and L. Bacteriology and mycology of cane sugar deterioration. Abstracts Bact. 5: 221-225 (1922). 54 references.
- OWEN, W. L. Deterioration of cane sugar in storage; its causes and suggested measures for its control. La. Agr. Expt. Sta. Bull. No. 162, 1918. 121 p. 30 references.
- SUGAR ACIDS**
- MEYER-JACOBSON. Polyoxymonocarbon-säuren die durch Umwandlung von Zuckerarten entstehen. *In* their Lehrb. org. Chem. 1, pt. 2: 602-620 (1913). Bibl. footnotes.
- NEUBERG, C., and REWALD, B. Säuren der Kohlenhydrate. *In* Abderhalden, Biochem. Handl. 2: 466-526 (1911); 8: 246-279 (1914). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Säuren der Kohlenhydrate. *In* Abderhalden, Biochem. Handl. 10: 681-720 (1923). Bibl. footnotes.
- SUGAR ALCOHOLS**
- NEUBERG, C., and REWALD, B. Alkohole der Zuckerreihe. *In* Abderhalden, Biochem. Handl. 2: 438-466 (1911); 8: 234-244 (1914). Bibl. footnotes.
- ZEMPLÉN, GÉZA. Alkohole der Zuckerreihe. *In* Abderhalden, Biochem. Handl. 10: 657-681 (1923). Bibl. footnotes.
- SUGAR BEET**
- BARNETT, CLARIBEL R. References to the literature of the sugar beet, exclusive of works in foreign languages. U. S. Dept. Agr., Library Bull. No. 16, 1897. 9 p.

SUGAR BEET—Cont'd

HARRIS, F. S. Sugar beet in America. New York, Macmillan, 1919. 342 p. Bibl., p. 295-311. About 300 references.

Recent chemical and physiological investigations on the sugar beet. Bull. Agr. Intel. Plant Diseases 3: 907-911 (1912).

SULFANILIC ACID

MEYER-JACOBSON. Sulfanilsäure. In *their* Lehrb. org. Chem. 2, pt. 1: 211 (1895). Bibl. footnotes.

SULFARSPHENAMINE

VOEGLIN, CARL. Sulfarsphenamine: its manufacture and its chemical and chemotherapeutic properties. U. S. Public Health Repts. 37: 2798 (1922).

See also ARSPHENAMINE.

SULFATASE

NEUBERG, CARL. Ueber das neue Ferment Sulfatase. Naturwissenschaften 12: 797-800 (1924). 13 footnotes.

SULFHYDRYL GROUP

THUMBERG, TORSTEN. Die biologische Bedeutung der Sulfhydrylgruppe. Ergeb. Physiol. 11: 328-329 (1911). 45 references.

SULFITE WASTE LIQUORS

HÄGLUND, ERIK. Die Sulfitablauge und ihre Verarbeitung auf Alkohol. Braunschweig, Vieweg, 1915. 56 p. Bibl. footnotes.

JOHNSON, B., and HOVEY, R. W. Utilization of waste sulfite liquors. A review of the literature. Canada, Dept. Interior, Forestry Br., Bull. No. 66, 1919. 195 p. Annotated.

MÜLLER, W. H. MAX. Literatur der Sulfitablauge, 1910-1913. Berlin, 1914. 114 p. 450 references.

SCHROHE, A. Uebersicht über die neuere in- und ausländische Patentliteratur betreffend die Verwertung und Aufarbeitung der Ablaugen und Abgase der Zellstoffindustrie (Von 1912-1925). Papierfabr. 23: 30-33, 63-65, 89-92, 158-161 (1925). List of patents, annotated. Chronological.

See also ALCOHOL, PAPER.

SULFOCYANATES

GUTHIER, A. Rhodanide. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 795-816 (1911).

VILLAIN, ERNST. Ueber das Vorkommen und den Nachweis des Rhodans in Menschen- und Tierkörper, und seine toxikologische und pharmakologische Bedeutung. Dissertation, Freiburg, 1903. 53 p. Bibl., p. 49-53.

SULFONAL

"Sulfonal." Ind.-Cat. S. G. O., 1st ser., 13: 875-876 (1892); 2nd ser., 17: 33-34 (1912).

See also SEDATIVES.

SULFOXIDES

FROMM, EMIL. Die basischen Eigenschaften der Sulfoxyde und ihre Stellung unter der organischen metalloide Basen. Ann. 396: 75-103 (1913). 70 footnotes.

SULFUR

AUGER, V. Soufre. In Moissan, Chim. min. 1: 325-406 (1904). 711 footnotes.

BRAUNS, REINHARDT. Beobachtungen ueber die Krystallisation des Schwefels aus seinem Schmelzfluss. Neues Jahrb. Mineral. Geol. 13: 39-41 (1899-1901). 50 references.

GT. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Sulfur and iron pyrites. London, 1922. 67 p. Bibl., p. 63-67.

KRUYT, HUGO R. Die dynamische Allotropie des Schwefels. Z. physik. Chem. 64: 516-517 (1908). 79 references, 1821-1908.

LINNE, BR., and EPHRAIM, F. Schwefel. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 332-704 (1907).

MARGOTTE, M. Soufre. In Frémy, Enc. chim. 2, 2^e cahier: 189-195 (1885).

ODÉN, SVEN. Der kolloide Schwefel. Nova Acta Regiae Soc. Sci. Upsaliensis IV, 3, No. 4, 1913. 193 p. Bibl., p. 5-11. 82 references.

"Sulfur and compounds." Ind.-Cat. S. G. O., 1st ser., 13: 876-878 (1892); 2nd ser., 17: 34-38 (1912).

VARI, J., and BRÄUER, J. Schwefel. In Bräuer and d'Ans, Fortschritte 1: 712 (1921). 45 German patents.

WIGAND, ALBERT. Statik und Kinetik der Umwandlung im flüssigen Schwefel und die Schmelzwärme des monoklinen Schwefels. Z. physik. Chem. 63: 273-306 (1908). Bibl. footnotes.

WIGAND, ALBERT. Zur Kenntniss des flüssigen Schwefels. Ann. Physik. 29: 1-64 (1909). Bibl. footnotes.

WIGAND, ALBERT. Die umkehrbare Lichtreaktion des Schwefels. Z. physik. Chem. 77: 423-471 (1911). Bibl. footnotes.

WILKINSON, HENRY E. Technology and commercial applications of sulfur. Chem. Age (N. Y.) 32: 22-24, 60-62, 140-145 (1924). 218 footnotes, largely patents.

SULFUR: Analytical.

ALLEN, I. C., and ROBERTSON, I. W. The sulfur content of fuels, especially petroleum products. U. S. Bur. Mines, Tech. Paper No. 26, 1912. 13 p. 64 footnotes.

BLUMENTHAL, P. L., and GUERNSEY, S. C. The determination of sulfur as barium sulfate. Iowa Agr. Expt. Sta., Res. Bull. No. 26: 391-435 (1915).

HOLLIGER, M. Zur Schwefelbestimmung in Kohlen und Koks. Z. angew. Chem. 22: 436-449. 493-497 (1909). 106 footnotes.

LINNE, BRUNO. Schwefel-Analytisches. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 380-384 (1907).

See also BARIUM SULFATE.

SULFUR: Metabolism.

LEWIS, HOWARD B. Sulfur metabolism. Physiol. Rev. 4: 419-423 (1924). 177 references.

SULFUR: Oxidation, biochemical.

DÜGGLI, M. [Sulfur bacteria.]. Neu-jahrsb. Naturf. Gesell. Zürich, No. 121, 1920. 43 p. 166 references.

JOFFE, JACOB S. Biochemical oxidation of sulfur and its significance to agriculture. N. J. Agr. Expt. Sta. Bull. No. 374, 1922. 91 p. Bibl., p. 82-90. 241 references.

LIPMAN, JACOB G., MACLEAN, HARRY C., and LINT, H. C. Sulfur oxidation in soils and its effect on the availability of mineral phosphates. Soil Science 2: 499-538 (1916). 56 references.

MACLEAN, HARRY C. Oxidation of sulfur by microorganisms in its relation to the availability of phosphates. Soil Science 5: 251-290 (1918). 76 references.

SULFUR CHLORIDES

ATEN, A. H. W. Untersuchungen ueber das System: Schwefel-Chlor. Z. physik. Chem. 54: 55-97 (1906). 62 references.

DITZ, HUGO. Chlor und Schwefel. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 188-194 (1909).

SULFUR DIOXIDE

HARPP, AUGUST. Flüssiges Schwefeldioxyd. Sammlung chem. chem.-tech. Vorträge 5: 235-414 (1900). Bibl. footnotes.

LINNE, BRUNO. Schwefeldioxyd und sog. schweflige Säure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 438-469 (1907).

WALDEN, P., and CENTNERSZWER, M. Flüssiges Schwefeldioxyd als Lösungsmittel. Z. anorg. Chem. 30: 145-250 (1902). Bibl. footnotes.

SULFUR DIOXIDE: Effect on vegetation.

BEROLZHEIMER, D., D. Bibliography on the effect of sulfur dioxide on vegetation and animal life. U. S. Bur. Mines, Bull. No. 98, 1915. Bibl., p. 503-520. 96 references.

See also SMOKE.

SULFUR DYES

LANGE, OTTO. Die Schwefelfarbstoffe, ihre Herstellung und Verwendung. Leipzig, Spamer, 1912. 499 p. Bibl. footnotes. Patents, p. 362-497.

MEYER-JACOBSON. Schwefelfarbstoffe. In their Lehrb. org. Chem. 2, pt. 3: 1504-1507 (1920). Bibl. footnotes.

See also DYES.

SULFUR IODIDES

DITZ, HUGO. Jod und Schwefel. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 388-389 (1909).

SULFUR SELENIDE

LINNE, BR. Schwefelselene. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 787-797 (1907).

SULFUR TRIOXIDE

BERL, E. Die Arsensäureanhydridkatalyse des Schwefeltrioxyds. Z. anorg. Chem. 44: 267-299 (1905). Bibl. footnotes.

LINNE, BR. Schwefeltrioxyd. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 470-480 (1907).

See also SULFURIC ACID.

SULFURIC ACID

CHWALA, A. Die Konzentration von Schwefelsäure. In Brüner and d'Ans, Fortschritte 1: 1017-1019 (1921). 70 German patents.

DOMKE, J., and BEIN, W. Ueber Dichte und Ausdehnung der Schwefelsäure in wässriger Lösung. Z. anorg. Chem. 43: 125-181 (1905). Bibl. footnotes.

HAND, A., and VARI, J. Schwefelsäure. In Brüner and d'Ans, Fortschritte 1: 815-819 (1921). About 200 German patents.

LINNE, BR. Schwefelsäure. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 480-556 (1907).

MARTIN, GEOFFREY. Sulfuric acid and sulfur products. London, Lockwood, 1916. 80 p. Bibl., p. 3, 11-12.

NOYES, A. A., and STEWART, M. A. The ionization relations of sulfuric acid. J. Am. Chem. Soc. 32: 1133-1162 (1910). 40 footnotes.

PARKER, JOHN W. Concentration of sulfuric acid. London, Gurney, 1924. 394 p. Bibl. footnotes with index of names.

"Sulfuric acid." Ind.-Cat. S. G. O., 1st ser., 1: 91-94 (1880); 2nd ser.,

SULFURIC ACID—Cont'd

1: 120-121 (1896); 3rd ser., 1: 127-128 (1918).

TRAUTZ, MAX. Zur physikalischen Chemie des Bleikammerprozesses. *Z. physik. Chem.* 47: 513-610 (1904). Bibls. on p. 519, 522, 524, 539, 548.

WAGGAMAN, WM. H. The production of sulfuric acid and a proposed new method of manufacture. U. S. Dept. Agr., Bull. No. 283, 1915. Patents.

WORDEN, E. C. Sulfuric acid. *In his* Technology of Cellulose Esters, 1: 1007-1402 (1920). 9376 references, including patents.

WYLD, WILFRED. Manufacture of sulfuric acid (Chamber process). London, Gurney, 1924. 424 p. Bibl. footnotes with index of names.

ZEISBERG, F. C. Thermal problems in sulfuric acid manufacture. *Trans. Am. Electrochem. Soc.* 36: 194 (1919). 26 patents on contact process.

See also ACIDS, ALKALIS AND SALTS.

SULFURIC ACID: Analytical.

HORN, D. W. Gravimetric determination of sulfuric acid in the presence of iron. *Am. Chem. J.* 27: 500-504 (1902). 85 footnotes.

LINNE, BR. Schwefelsäure—Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 554-556 (1907).

VAUBEL, W. Die Bestimmung der Schwefelsäure und des Kaliums insbesondere in Kalisalze. *Z. oeffentl. Chem.* 20: 426-434 (1914). 31 footnotes.

See also SULFUR.

SULFUROUS ACID

HAND, A. Schweflige Säure. *In* Bräuer and d'Ans, Fortschritte, 1: 767-769 (1921). 160 German patents.

See also SULFUR DIOXIDE.

SULFURYL CHLORIDE

DITZ, HUGO. Sulfurychlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 197-200 (1909).

SUPERPHOSPHATES

SCHUCHT, L. Die Fabrikation des Superphosphats. 3rd ed. Brunswick, 1909. 460 p. Selected bibl.

See also CALCIUM PHOSPHATE, FERTILIZERS.

SUPRARENALS

CRAWFORD, ALBERT C. Chemistry of the suprarenal glands. *In* Barker, Endocrinology and metabolism 2: 77-98; references 5: 167-219 (1922).

FÜRTH, OTTO v. Neue Untersuchungen ueber die chemische Zusammensetzung der gefässverengernden

Substanz in den Nebennieren. *Biochem. Centr.* 2: 1-9 (1903). 31 references.

GRADINESCU, ARISTIDE v. Der Einfluss der Nebennieren auf den Blutkreislauf und den Stoffwechsel. *Arch. ges. Physiol.* 152: 187-253 (1913). Bibl. footnotes.

HARTMAN, FRANK A. The general pharmacology and toxicology of the suprarenal glands. *In* Barker, Endocrinology and metabolism 2: 237-255; references, 5: 167-219 (1922).

HIRSCH, RAHEL. Die Nebennieren. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 308-331 (1910). 84 footnotes. "Suprarenal extracts." *Ind.-Cat. S. G. O.*, 2nd ser., 17: 73-87 (1912).

See also ADRENALINE.

SURFACE COMBUSTION

BACON, R. F., and HAMOR, W. A. Surface combustion. *In their* American Fuels 2: 1091-1094. 1922. 80 references.

BLAKE, A. E. Surface combustion. *Proc. Eng. Soc. Western Penn.* 36: 169-174 (1920).

SURFACE TENSION

CHWOLSON, O. D. Oberflächenspannung und Kapillarität. *In his* Lehrbuch der Physik. 1, pt. 2: 224-228 (1918).

FERGUSON, ALLAN. The measurement of surface tension. *In* Fifth report on colloid chemistry, 1923, 1-13. 53 references.

HANDOVSKY, HANS. Oberflächenerscheinungen. *In* Oppenheimer, Handb. Biochem., 2nd ed., 2: 30-39 (1923). 31 footnotes.

KANITZ, ARISTIDES. Die Messung der Oberflächenspannung. *In* Oppenheimer, Handb. Biochem., Ergänzungsband, 1913, 1-9. 29 references.

MACALLUM, A. B. Oberflächenspannung und Lebenserscheinungen. *Ergeb. Physiol.* 11: 598-602 (1911). 104 references.

MELLOR, J. W. The surface tension and surface energy of liquids and solids. *In his* Inorg. theor. chem. 1: 846-860 (1922). 150 references.

NUTTALL, W. H. Industrial applications of wetting power. *In* Fifth report on colloid chemistry, 1923, 38-47. 43 references.

TABLES ANNUELLES. Tension superficielle. 1: 42-44 (1910); 2: 33-37 (1911); 3: 46-48 (1912); 4: 99-132 (1913-1916). References to all quantitative data during those years.

TRAUBE, J. Die Theorie des Haftdrucks (Oberflächendrucks) und ihre Bedeutung für die Physiologie.

- Arch. ges. Physiol. 132: 511-538 (1910). Bibl. footnotes.
- WALDEN, P., and SWINNE, R. Ueber die Temperaturkoeffizienten der molaren Oberflächenenergie und molaren Kohäsion. *Z. physik. Chem.* 82: 271-313 (1913). Bibl. footnotes.
- WILLOW, R. S., and HATSCHKE, E. Surface tension. 3rd ed. Philadelphia, Blakiston, 1923. 134 p. Bibl. footnotes.
- See also* CAPILLARITY, FLOTATION.
- SYRINGIC ACID**
- BOGERT, M. T., and PLANT, E. Synthesis of certain substituted syringic acids. *J. Am. Chem. Soc.* 37: 2723 (1915). 25 references.
- TALC**
- DOELTER, C. Talk (Steatit). *In his Handb. Mineralchem.* 2, pt. 1: 356-374 (1914). Bibl. footnotes.
- HOPKINS, O. B. A report on the asbestos, talc and soapstone deposits of Georgia. *Georgia Geol. Sur., Bull.* No. 29, 1914. 319 p. Bibl., p. 302-303. 44 references.
- PECK, FREDERICK B. Talc and soapstone. *Mineral Ind.* 29: 652-658 (1920). 8 references.
- See also* MAGNESIUM SILICATE, SERPENTINE.
- TANNERY WASTES.** *See* WASTE.
- TANNIC ACID AND TANNINS**
- BAY, JENS C. Bibliography of the tannoids. St. Louis, 1893. 27 p. Reprinted from Fifth annual rept., Missouri Botanical Garden.
- BRAEMER, LOUIS. Les tannoides. Thesis, Univ. Lyons, 1890. 180 p. Bibl. through text.
- DEAN, ARTHUR L. Composition of tanning materials. *J. Am. Leather Chem. Assoc.* 6: 172-188 (1911). 1828-1909.
- DEKKER, JOHANNES. [A botanical and a chemical study of tannins.] *Bul. Kolon. Mus. Haarlem*, 1906, No. 35. 221 p.
- DEKKER, JOHANNES. Die Gerbstoffe. Botanisch-chemische Monographie der Tannide. Berlin, Borntraeger, 1913. 586 p. Bibl., p. 1-102. 1754-1912.
- FEIST, K., and HAUN, H. Vergleichende Untersuchungen ueber die Konstitution des Tannins aus türkischen und chinesischen Galläpfeln. *Arch. Pharm.* 251: 468-525 (1915). Bibl. footnotes.
- FREUDENBERG, KARL. Nachweis, Isolierung, Abbau- und Aufbau-studien auf dem Gebiete der Gerbstoffe. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 1: 439-554 (1921). Bibl. footnotes.
- KNUDSON, LEWIS. Tannic acid fermentation. *J. Biol. Chem.* 14: 159-202 (1913). 60 footnotes.
- LANGENBECK, WOLFGANG. Gerbstoffe. *In* Abderhalden, *Biochem. Handl.* 11: 465-489 (1924). Bibl. footnotes.
- LLOYD, FRANCIS E. Mode of occurrence of tannin in the living cells. *J. Am. Leather Chem. Assoc.* 17: 448-450 (1922). 28 references.
- NIERENSTEIN, M. Chemie der Gerbstoffe. Sammlung chem. chem.-tech. Vorträge 15: 219-276 (1910). Bibl. footnotes.
- NIERENSTEIN, M. Fortschritte der Gerbstoffchemie, 1905-1910. *Chem.-Ztg.* 34: 625-626 (1910). 30 footnotes.
- NIERENSTEIN, M. Die Gerbstoffe. *In* Abderhalden, *Biochem. Handl.* 7: 1-31 (1912). Bibl. footnotes.
- SPENCER, G. L. Tannin analysis. *In* U. S. Dept. Agr., *Bur. Chem., Bull.* No. 13, pt. 7: 997-1004 (1892).
- TRIMBLE, HENRY. The tannins. A monograph on their history, preparation, properties, methods of estimation and uses of vegetable astringents. Philadelphia, Lippincott, 1892. Bibl., p. 109-165, covering 1791-1891.
- See also* GALLIC ACID.
- TANNING**
- BURTON, DONALD. Bibliography of chrome tanning. *J. Soc. Leather Trades' Chem.* 7: 114-116 (1923); 8: 230 (1924); *J. Am. Leather Chem. Assoc.* 18: 130-139 (1923); 20: 158-165 (1925). 327 references.
- FAHRION, W. Die Gerbereichemie, 1913-1915. *Z. angew. Chem.* 27: 457-464 (1914); 114 footnotes. 28: 257-259, 268-272, 277-279 (1915); 119 footnotes. 29: 269-273, 288-290 (1916); 120 footnotes.
- HOU, TE-PANG. Iron tannage. *J. Am. Leather Chem. Assoc.* 16: 248-250 (1921). 46 references.
- JONG, H. G. B. DE. Contributions to the theory of vegetable tanning. Dehydration of lyophilic sols and gels by tannins and its bearing on the theory of vegetable tanning. *J. Am. Leather Chem. Soc.* 19: 14-57 (1924); *Rec. trav. chim. P.-B.* 43: 437-472 (1923). 81 footnotes.
- LAUFFMANN, R. Bericht ueber die Fortschritte in der Gerbereichemie, 1913-1916. *Kolloid-Z.* 19: 36-46, 98-107, 133-153 (1916); 230 footnotes. 24: 69-72, 81-95 (1919). 127 footnotes.
- MEUNIER, LOUIS. Modern theories of the various methods of tanning. *Chimie & Industrie* 1: 71-80, 272-

TANNING—Cont'd

- 276 (1918); J. Am. Leather Chem. Assoc. 13: 530-553 (1918). 34 footnotes.
- NEUNER, FRANZ CH. Bericht ueber die Fortschritte der Gerbereichemie in den Jahren 1908-1910. Kolloid-Z. 8: 65-72, 144-157 (1911); J. Am. Leather Chem. Assoc. 6: 225-249 (1911). 106 footnotes (253 footnotes in original).
- PROCTOR, H. R. Colloid chemistry of tanning. In First report on colloid chemistry, 1917, p. 14-20; J. Am. Leather Chem. Assoc. 14: 291-300 (1919). About 100 references, annotated, covering 1912-1916.
- SEYMOUR-JONES, F. L. Mineral tannages. J. Ind. Eng. Chem. 14: 832-834 (1922). 37 references.
- THOMAS, ARTHUR W. Vegetable tanning. J. Ind. Eng. Chem. 14: 829-831 (1922). 29 references.

See also LEATHER.

TANNINS: Synthetic.

- FISCHER, EMIL. Synthesis of depsides, lichen-substances and tannins. Ber. 46: 3253-3289 (1913); J. Am. Chem. Soc. 36: 1170-1201 (1914); J. Am. Leather Chem. Assoc. 9: 280-318 (1914). Bibl. footnotes.
- FISCHER, EMIL. Untersuchungen ueber Depside und Gerbstoffe (1908-1919). Berlin, 1919. 541 p. Bibl. footnotes.
- GRASSER, GEORG. The synthesis of tanning materials. Collegium No. 602: 234 (1920); J. Am. Leather Chem. Assoc. 16: 20-46 (1921). 35 footnotes.
- GRASSER, GEORG. Synthetic tannins. Their synthesis, industrial production and application. New York, Van Nostrand, 1922. 143 p. Bibl. footnotes.
- SÜVERN, K. Die synthetischen Gerbstoffe. Kunststoffe 7: 43-47 (1917). 32 patents. Supplemented by WILHELM, *Ibid.* 10: 13-15 (1920). 28 patents.

TANTULUM

- CHILESOTTI, —. Tantal. In Abegg, Handb. anorg. Chem. 3, pt. 3: 866-867 (1907). 56 references.
- JOLY, M. A. Tantale. In Frémy, Enc. chim. 3, 7^e cahier: 116 (1888).
- KAUSCH, OSKAR. Die Verwendung des Tantals und seiner Verbindungen. Edel-Erden u. -Erze 1: 173-175 (1920). References through text.
- MONIOTTE, M. Tantale. In Moissan, Chim. min. 2: 143-152 (1905). 176 footnotes.
- SHILLING, JOH. Das Vorkommen von Tantal und Niob. Z. angew. Chem.

18: 883-901 (1905). Names of minerals with references.

See also RARE EARTHS.

TARTARIC ACID

- GUTBIER, A. Tartrate. In Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 3: 707-719 (1911).
- HÄUSSLER, E. P. Die Methoden zur quantitativen Bestimmung der Weinsäure im Lebensmitteln (speziell in Weinen). Schweiss Apoth.-Ztg. 52: 525, 537, 555, 569 (1914). 47 footnotes.
- KAHN, MAX. The behavior of tartaric acid and the tartrates in the animal organism. Biochem. Bull. 4: 398-409 (1915). 61 footnotes.
- MEYER-JACOBSON. Weinsäure. In their Lehrb. org. Chem. 1, pt. 2: 664-688 (1913). Bibl. footnotes.
- THIELE, A. d-Weinsäure. In Abderhalden, Biochem. Handl. 1: 1158-1165 (1911). 157 footnotes (includes derivatives).
- THIELE, A. Traubensäure. In Abderhalden, Biochem. Handl. 1: 1165-1168 (1911). 36 footnotes.
- TASTE**
- HENNING, HANS. Physiologie und Psychologie des Geschmacks. Ergeb. Physiol. 19: 1-30 (1921). 823 references.
- OERTLY, ERNST, and MYERS, ROLLIN G. A new theory relating constitution to taste; simple relations between the constitution of aliphatic compounds and their sweet taste. J. Am. Chem. Soc. 41: 855-867 (1919). Bibl. footnotes.
- "Taste." Ind.-Cat. S. G. O., 1st ser., 14: 218-220 (1893); 2nd ser., 17: 618-620 (1912).
- TAURINE**
- FUNK, C. Taurin. In Abderhalden, Biochem. Handl. 4: 953-956 (1911). 50 footnotes.
- MEYER-JACOBSON. Taurin. In their Lehrb. org. Chem. 1, pt. 2: 281-282 (1913). Bibl. footnotes.
- TAUTOMERISM**
- ACREE, S. F. Constitution of phenylurazole. Am. Chem. J. 38: 1-91 (1907). Bibl. footnotes.
- JONES, L. W. Electromers and stereomers with positive and negative hydroxyls. J. Am. Chem. Soc. 36: 1268-1290 (1914). 40 footnotes.
- MEYER-JACOBSON. Gleichgewichtsisomerie. In their Lehrb. org. Chem. 1, pt. 1: 118-124 (1907). Bibl. footnotes.
- OPPÉ, ALFR. Tautomerie und Desmotropie. Jahrb. Radioakt. Elektronik 10: 368-405 (1913). 130 references.

RABE, PAUL. Beiträge zur Aufklärung der Tautomerieerscheinungen. *Ann.* 313: 129-207 (1900). 135 footnotes.

WISLICENUS, W. Ueber Tautomerie. *Sammlung chem. chem.-tech. Vorträge* 2: 187-256 (1898). *Bibl. footnotes.*

See also DIKETONES, ISOMERISM.

TEA

NEUVILLE, H. Technologie du thé. Paris, Challamel, 1905. 269 p. *Bibl.*, p. 261-265.

SPENCER, G. L. Bibliography of the literature on teas. *In* U. S. Dept. Agr., Bur. Chem., *Bull.* No. 13, 992-993 (1892).

"Tea." *Ind.-Cat. S. G. O.*, 1st ser., 14: 236-239 (1893); 2nd ser., 17: 632-634 (1912).

See also BEVERAGES, FOODS (Vereinbarungen).

TEETH

PERLZWEIG, WM. A. Chemical study of nutritive factors in the development of teeth and bones. Thesis, Columbia Univ., 1916. (Reprinted from *Trans. Dental Soc. State of N. Y.*, 1916). *Bibl.*, p. 218-220.

"Teeth, chemistry of." *Ind.-Cat. S. G. O.*, 2nd ser., 17: 649-650 (1912).

See also BONES.

TELLURIUM

METZNER, R. Tellure. *In* Moissan, *Chim. min.* 1: 488-527 (1904). 217 footnotes.

PRANDTL, W. Tellur. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 852-933 (1908).

See also SELENIUM.

TELLURIUM: Radioactivity.

LUCAS, RICHARD. Radiotellur. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 36-38 (1908).

TELLURIUM OXIDES

PRANDTL, W. Tellur und Sauerstoff. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 880-888 (1908).

ROSENHEIM, ARTHUR, and JANDER, G. Ueber die Tellursäure und ihre Alkalisalze in ihrem Verhalten als Halbkolloide. *Kolloid-Z.* 22: 22-44 (1918). 60 footnotes.

TERBIUM

JAMES, C., and BISSEL, D. W. Terbium. *J. Am. Chem. Soc.* 36: 2060-2066 (1914). 16 footnotes.

MELLOR, J. W. Terbium family. *In* his *Inorg. theor. chem.* 5: 686-696 (1924).

See also RARE EARTHS.

TEREBINIC ACID

MEYER-JACOBSON. Terebinsäure. *In* their *Lehrb. org. Chem.* 1, pt. 2: 660-661 (1913).

TERPENES

BARTELT, K. Terpene. *In* Abderhalden, *Biochem. Handl.* 7: 266-472 (1912). About 1600 footnotes.

BOURNOT, KONRAD. Fortschritte auf dem Gebiete der Terpenchemie in den Jahren 1918-1923. *Z. angew. Chem.* 38: 105-110, 128-135 (1925). *Bibl. footnotes.*

HEUSLER, F. Chemistry of the terpenes. Philadelphia, Blakiston, 1902. 457 p. *Bibl. footnotes.*

MEYER-JACOBSON. Die Derivate der hydrierten Cymole. *In* their *Lehrb. org. Chem.* 2, pt. 1: 876-1044 (1902). *Bibl. footnotes.*

MEYER-JACOBSON. Sesquiterpen-Körper. *In* their *Lehrb. org. Chem.* 2, pt. 4: 33-68 (1924). *Bibl. footnotes.*

MÜLLER, E. Terpen- und Riechstoffchemie. *Fortschritte Chem.* 2: 337-352 (1910); 4: 77-94 (1911); 6: 45-67 (1912-1913); 8: 117-139 (1913); 10: 95-112, 183-191 (1914-1915). References through text.

PRATT, WM. B. Sulfur-terpene substitution products. *Ind. Eng. Chem.* 15: 178-181 (1923). 40 references.

WALLACH, O. Terpene und Campher—Zusammenfassung einiger Untersuchungen auf den Gebiet der alicyclischen Kohlenstoffverbindungen. Leipzig, Veit, 1914. 580 p. *Bibl. footnotes.*

See also ESSENTIAL OILS.

TERPINEOL

BARTELT, K. Terpeneol. *In* Abderhalden, *Biochem. Handl.* 7: 388-392 (1912). 75 footnotes.

TETRACHLOROETHANE

WORDEN, E. C., and RUSTEIN, LEO. Tetrachloräthan. *Kunststoffe* 3: 83-84 (1913). *Bibl. footnotes.*

TETRACHLOROQUINONE

MEYER-JACOBSON. Tetrachlorchinon (Chloranil). *In* their *Lehrb. org. Chem.* 2, pt. 1: 448 (1896).

TETRAHEDRITE

PETERS, FRANZ. Tetraëdrit. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 5, pt. 1: 1253-1256 (1909).

TETRAHYDRONAPHTHALENE

FRANZ, —. [Tetralin and other hydrogenated naphthalenes.] *Kunststoffe* 10: 185-187 (1920). *Patents.*

TETRAHYDROPYRIDINE

LIPP, A., and WIDNMANN, E. Zur Kenntniss einiger Tetrahydropyridine und ihr Verhalten zu Aldehyden. *Ann.* 409: 79-147 (1915). *Bibl. footnotes.*

TETRATHIONIC ACID

LINNE, BR. Tetrathionsäure. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 1: 604-609 (1907).

TETRAZINE COMPOUNDS

MEYER-JACOBSON. Tetrazin-Körper. *In their Lehrb. org. Chem.* 2, pt. 3: 1529-1543 (1920). Bibl. footnotes.

TETRAZOLE COMPOUNDS

MEYER-JACOBSON. Tetrazol-Körper. *In their Lehrb. org. Chem.* 2, pt. 3: 668-681 (1916). Bibl. footnotes.

TETRYL

DESVERGNES, M. L. Le tétryl, propriétés, fabrication et essais. *Mem. poudres* 19: 217-218 (1922). 34 footnotes.

See also EXPLOSIVES.

TEXTILES

BEAUVERIE, J. Les textiles végétaux. Paris, Gauthier, 1913. 730 p.

BRADFORD, Public Free Library. Hand list of books in the reference library relating to the textile industries. Bradford, Eng., Sewell, 1901. 14 p.

GT. BRIT. Patent Office. Subject list of works on the textile industries and wearing apparel, including the culture and chemical technology of the textile fibers in the Library of the Patent Office. London, 1919. 329 p.

KNIT GOODS MANUFACTURERS OF AMERICA. References on the knit goods industry. Utica, 1920. 34 p.

LITTLE, ERNEST L. References on the textile industry. Special Libraries 8: 174-176, 179 (1917); 9: 24-25 (1918). 170 references.

LOWELL, City Library. Textiles: a list of books relating to textiles in the Lowell city library. Lowell, Mass., 1909. 16 p.

MEYER, H. H. B. References on hat manufacture and trade. Special Libraries 9: 107-108 (1917). 51 references.

SCHULZE & Co. Die Textile-Literatur, 1890-1910. 1910. 44 p.

"Textile bibliography." *J. Textile Inst.* 3: 89-225, 437-699 (1912); 4: 101-188, 295-472 (1913); 5: 105-184, 273-336, 397-456, 507-556 (1914). Annotated.

ULRICH, G. Development of the textile chemistry in late years. *Oesterr. Chem.-Ztg.* 16: 160-164.

WARD, J. S. M. Textile fibers and yarns. London, Benn, 1924. 192 p. Bibl., p. 171-179.

Serial

Color trade journal. 1917-. Contains "Review of recent literature" on textile chemistry.

Journal of the Society of Dyers and Colourists. 1884-. Classified: Plant and machinery; acids, alkalies and salts; mordants, oils, detergents,

solvents; bleaching, sizing, finishing materials; coloring matters; textile fibers, yarns, fabrics; paper, leather, rubber; textile printing; sizing and finishing; analytical; miscellaneous.

Journal of the Textile Institute. 1910-. Classification: Fibers and their production; conversion of fibers into finished products; conversion of yarns into fabrics; chemical and other processes; laundering and dry cleaning; chemical and physical analysis, testing and grading.

See also BLEACHING, COTTON, DYEING, FIBERS, PAPER YARN, SILK, ETC.

TEXTILES: Analysis.

SOLARO, A. Studio microscopico e chimico pel riconoscimento delle fibre vegetali lane, pelli, pellicce, sete naturali, sete artificiali. Analisi quantitativa del tessuti ed altri manufatti tessili. Milan, Hoepli, 1914. 417 p.

TEXTILES: Fireproofing.

KAUSCH, OSKAR. Die Herstellung wasserdichter und feuersicherer Stoffe durch Imprägnieren von Geweben. *Kunststoffe* 2: 29-31, 52-54, 88-93 (1912). Patents.

See also WATERPROOFING.

THALLIUM

DOAN, MARTHA. Index to the literature of thallium, 1861-1896. *Smithsonian Pub. No.* 1171, 1899. 26 p.

HALEN, S. Die Verwendung des Thalliums und seiner Verbindungen. *Edel-Erden u. -Erze* 1: 205-207 (1920). Bibl. through text.

LITTLE, H. F. V. Thallium. *In* Friend, Textbook 4: 164-203 (1917). Bibl. footnotes.

MELLOR, J. W. Thallium. *In his* *Inorg. theor. chem.* 5: 406-479 (1924).

MEYER, RICHARD J. Thallium. *In* Abegg, *Handb. anorg. Chem.* 3, pt. 1: 450-457 (1906). 336 references, 1861-1906.

SABATIER, PAUL. Thallium. *In* Frémy, *Enc. chim.* 3, 6^e cahier: 423-424 (1885).

SCHLENK, O. Thallium. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 4, pt. 1: 389-484, 1021-1056 (1911).

THOMAS, V. Thallium. *In* Moissan, *Chim. min.* 4: 910-952 (1905). 345 footnotes.

THALLIUM CHLORIDES

KORRENG, ERNST. Kristallographische und thermische Untersuchungen von binären Systemen aus Thallochlorid und Chloriden zweiwertiger Metalle. *Neues Jahrb. Mineral. Geol.* 37: 51-124 (1914). Bibl. footnotes.

THEOBROMINE

MEYER-JACOBSON. Theobromin. *In their* Lehrb. org. Chem. 2, pt. 3: 1287-1290 (1920). Bibl. footnotes.

"Theobromine." Ind.-Cat. S. G. O., 1st ser., 14: 411 (1893); 2nd ser., 18: 64-65 (1913).

See also PURINES, TEA.

THEOPHYLLINE

MEYER-JACOBSON. Theophyllin. *In their* Lehrb. org. Chem. 2, pt. 3: 1284-1285 (1920). Bibl. footnotes.

"Theophyllin." Ind.-Cat. S. G. O., 2nd ser., 18: 65-66 (1913).

See also PURINES.

THERMAL CONDUCTIVITY

INGERSOLL, L. R. Methods of measuring thermal conductivity in solids and liquids. *J. Optical Soc. Am.* 9: 495-501 (1924). 51 footnotes.

LANDOLT-BÖRNSTEIN. Wärmeleitung. *In their* Tabellen, 5th ed., 1923, 1311-1314.

MEISSNER, WALTHER. Thermische und elektrische Leitfähigkeit der Metalle. *Jahrb. Radioakt. Elektronik* 17: 229-276 (1921). 61 references.

TABLES ANNUELLES. Conductibilité thermique. 2: 51-54 (1911); 3: 57-59 (1912); 4: 153-155 (1913-1916). References to numerical data.

THERMAL EXPANSION

CLARKE, FRANK W. Tables of expansion by heat for solids and liquids. Constants of Nature, pt. 3. Smithsonian Misc. Coll., No. 289. 1876. 57 p. Bibl., p. 5-8. 56 references.

DAVIDTS, ALFONS. Die Wärmeausdehnung wässeriger Salzlösungen. *Z. physik. Chem.* 79: 303-356 (1912). Bibl. footnotes; bibl. of 70 references, p. 354-356.

LANDOLT-BÖRNSTEIN. Thermische Ausdehnung. *In their* Tabellen, 4th ed., 1912, 352-357; 5th ed., 1923, 1236-1241.

THERMOCHEMISTRY

BARY, FREDERICK. The influence of temperature on chemical reactions in general. *Am. J. Bot.* 1: 223-225 (1914).

LANDOLT-BÖRNSTEIN. Thermochemie. *In their* Tabellen, 4th ed., 1912, 829-948; 5th ed., 1923, 1467-1630. References through text.

TABLES ANNUELLES. Thermochemie. 1: 428-435 (1910); 2: 489-494 (1911); 3: 345-349 (1912); 4: 827-849 (1913-1916). References to numerical data.

WARTENBURG, W. v. Thermochemie. *Fortschritte Chem.* 1: 59-64, 331-336 (1909); 2: 205-214 (1910); 3: 125-130 (1910-1911); 4: 1-6, 371-380 (1911); 5: 281-289 (1912); 6: 221-

227 (1912-1913); 7: 195-206 (1912); 8: 187-194 (1913); 9: 225-231 (1914); 11: 97-106 (1915-1916). References through text.

THERMODYNAMICS

DUHEM, PIERRE M. M. Traité élémentaire de mécanique chimique fondée sur la thermodynamique. Paris, Hermann, 1897-1899. 4 vols. Bibl., 4: 365-370.

MELLOR, J. W. Thermodynamics and thermochemistry. *In his* Inorg. theor. chem. 1: 688-739 (1922). About 125 references.

PARTINGTON, J. R. Chemical thermodynamics. New York, Van Nostrand, 1924. 275 p. Bibl. footnotes.

TABLES ANNUELLES. Thermodynamique. 1: 59-62 (1910); 2: 54-55 (1911); 3: 60-61 (1912); 4: 156-161 (1913-1916).

"Thermodynamics." Ind.-Cat. S. G. O., 2nd ser., 18: 105-110 (1913).

TUCKERMAN, ALFRED. Index to the literature of thermodynamics. Smithsonian Pub. No. 741, 1890. 239 p. Subject and author index.

THERMOMETRY

DAY, A. L., and SOSMAN, R. B. Realization of the absolute scale of temperature. *In* Glazebrook, Dictionary of Applied Physics 1: 869-871 (1921). 127 references.

GRIFFITHS, E. Resistance thermometers. *In* Glazebrook, Dictionary of Applied Physics 1: 710 (1921). 35 references.

LANDOLT-BÖRNSTEIN. Thermometrie. *In their* Tabellen, 5th ed., 1214-1215 (1923).

"Thermometers." Ind.-Cat. S. G. O., 1st ser., 14: 452-454 (1893); 2nd ser., 18: 111-112 (1913).

WADNER, C. W., and BURGESS, J. K. Platinum resistance thermometry at high temperatures. U. S. Bur. Standards, Bull., 6: 223-230 (1910).

THERMOSTATS

GEER, WM. C. Thermostats and thermoregulators. *J. Phys. Chem.* 6: 101-105 (1902).

"Thermostats." Ind.-Cat. S. G. O., 1st ser., 14: 279 (1893); 2nd ser., 18: 113 (1913).

THIAZOLE

MEYER-JACOBSON. Isothiazol- und Thiazol-Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 533-558 (1916).

THIGENOL

"Thigenol." Ind.-Cat. S. G. O., 2nd ser., 18: 121 (1913).

THIOALDEHYDES

MEYER-JACOBSON. Thioaldehyde. *In their* Lehrb. org. Chem. 1, pt. 1: 741-748 (1907). Bibl. footnotes.

THIOCOL

"Thiocol." Ind.-Cat. S. G. O., 2nd ser., 18: 128 (1913).

THIOCYANIC ACID

FUNK, C. Rhodanwasserstoffsäure. *In* Abderhalden, Biochem. Handl. 4: 943-949 (1911). 110 footnotes.

GROSSMANN, HERMANN. Ueber einige Halogenorhodanide und die Beziehungen des Rhodanions zu dem Halogenionen und dem Cyanion. *Z. anorg. Chem.* 37: 411-447 (1903). 133 salts are listed with references.

MEYER-JACOBSON. Thiocyanssäure. *In their* Lehrb. org. Chem. 1, pt. 2: 1304-1310 (1913).

THIONAPHTHENES

MEYER-JACOBSON. Die Thionaphthen-Gruppe. *In their* Lehrb. org. Chem. 2, pt. 3: 131-142 (1915). Bibl. footnotes.

THIONYL CHLORIDE

DITZ, HUGO. Thionylchlorid. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 2: 195-197 (1907).

THIOPHENE

MEYER, VICTOR. Die Thiophengruppe. Braunschweig, Vieweg, 1888. Bibl., p. 293-296.

MEYER-JACOBSON. Die Thiophen-Gruppe. *In their* Lehrb. org. Chem. 2, pt. 3: 110-131 (1915). Bibl. footnotes.

THIOPHENOLS

MEYER-JACOBSON. Einwerthige Thiophenole und Merkapthane. *In their* Lehrb. org. Chem. 2, pt. 1: 470-472 (1896).

THIOSINAMINE

"Thiosinamine." Ind.-Cat. S. G. O., 1st ser., 14: 470 (1893); 2nd ser., 18: 129-130 (1913).

THIOSULFURIC ACID

LINNE, BR. Thioschwefelsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 571-587 (1907).

THIOUREA

MEYER-JACOBSON. Thioharnstoff. *In their* Lehrb. org. Chem. 1, pt. 2: 1438-1447 (1913).

THOMAS SLAG

DAFERT, F. W. Gewinnung und Eigenschaften der Thomasschlacke. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 370-382 (1918). Bibl. footnotes.

See also CALCIUM PHOSPHATE, FERTILIZERS.

THORIUM

BASKERVILLE, CHARLES. Thorium, carolinium, berzelium. *J. Am. Chem. Soc.* 26: 922-942 (1904). 75 footnotes.

CAVEN, R. M. Thorium. *In* Friend, Textbook, 5: 277-313 (1917). Bibl. footnotes.

CLEVE, P. T. Le thorium et ses composés. *In* Frémy, Enc. chim. 3, 5^e cahier: 70-71 (1884).

ÉTARD, —. Thorium. *In* Moissan, Chim. min. 3: 861-885 (1904). 159 footnotes.

HALEN, S. Die neuesten Arbeiten ueber Thorium, Thoriumverbindungen, Mesothorium, Radiothor, usw. Edel-Erden u. -Erze 2: 83-85 (1921). Covers 1917-1920.

HALEN, S. Die Verwendung des Thoriums und seiner Verbindungen. Edel-Erden und -Erze 2: 18-20, 25-27, 41-43 (1920).

JOUET, CAVALIER H. Index to the literature of thorium, 1817-1902. Smithsonian Pub. No. 1374. 1903. 154 p. 1123 references; chronological with author index.

LERCH, F. v. Die physikalischen und chemischen Eigenschaften der Umwandlungsprodukte des Thoriums. Jahrb. Radioakt. Elektronik 2: 463-475 (1906). Bibl. footnotes.

MEYER, R. J. Thor. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 851-856 (1909). 191 references, 1817-1909.

SCHALLER, WALDEMAR T. Thorium in 1919. U. S. Geol. Sur., Mineral Resources 1919, pt. 1: 16-18. 40 references.

"Thorium and mesothorium." Ind.-Cat. S. G. O., 2nd ser., 18: 155-156 (1913).

THORIUM: Analytical.

BONARDI, J. P. Selected bibliography on the qualitative and quantitative chemistry of cerium and thorium. *In* U. S. Bur. Mines, Bull. No. 212, p. 66-70. 105 references.

THORIUM: Radioactivity.

LUCAS, RICHARD. Thoraktivität. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 11-17 (1908).

THROMBASE

ZUNZ, EDGARD. Thrombase. *In* Abderhalden, Biochem. Handl. 5: 626-629 (1911). 50 footnotes.

See also ENZYMES.

THUJONE

MEYER-JACOBSON. Thujon. *In their* Lehrb. org. Chem. 2, pt. 1: 975-980 (1902). Bibl. footnotes.

THULIUM

JAMES, C. Thulium. *J. Am. Chem. Soc.* 33: 1332-1344 (1911). 16 references.

See also RARE EARTHS.

THYMINES. See PYRIMIDINES.**THYMOL**

EINBECK, H. Thymol. *In* Abderhalden, Biochem. Handl. 1: 584-591 (1911). 135 footnotes (includes derivatives).

PHILLIPS, MAX. A synthesis of thymol from paracycmen. Thesis, George Washington Univ., 1923. 18 p. Bibl., p. 17-18.

"Thymol." Ind.-Cat. S. G. O., 1st ser., 14: 521 (1893); 2nd ser., 18: 203 (1913).

THYMOQUINONE

WITTE, E. Thymochinon. In Abderhalden, Biochem. Handl. 1: 908-910 (1911). 35 footnotes.

THYMUS

HIRSCH, RAHEL. Thymus und Hypophyse. In Oppenheimer, Handb. Biochem. 3, pt. 1: 332-343 (1910). 75 footnotes.

HOSKINS, E. R. Is there a thymus hormone? Endocrinology 2: 241-257 (1918). 41 references.

"Thymus extract." Ind.-Cat. S. G. O., 2nd ser., 18: 205-206 (1913).

THYROID

CAMERON, A. T. Biochemistry of the thyroid gland. In Barker, Endocrinology and metabolism 1: 243-265; references, 5: 45-90 (1922).

HERRING, P. T. Influence of the thyroid upon the functions of the suprarenals. Endocrinology 4: 577-599 (1920). 69 references.

HIRSCH, RAHEL. Thyreoidea und Epithelkörperchen. In Oppenheimer, Handb. Biochem. 3, pt. 1: 271-307 (1910). 140 footnotes.

KURIYAMA, S. Liver glycogen in thyroid-fed animals. J. Biol. Chem. 33: 193 (1918). 42 references.

MARINE, DAVID. Present status of the functions of the thyroid gland. Physiol. Rev. 2: 521-551 (1922). 208 references.

"Thyroid extract." Ind.-Cat. S. G. O., 2nd ser., 18: 218-222 (1913).

"Thyroidin." Ind.-Cat. S. G. O., 2nd ser., 18: 248-249 (1913).

VAN DYKE, HARRY B. A study of the distribution of iodine between cells and colloids in the thyroid gland. J. Biol. Chem. 54: 181 (1922); Am. J. Physiol. 56: 18 (1921); Thesis, Univ. Chicago, 1921.

WELLS, H. G. Chemical pathology of the ductless glands. Diseases of the thyroid. In his Chemical pathology, 4th ed., p. 597-612 (1920). 100 footnotes.

TIN

CAVEN, R. M. Tin. In Friend, Textbook, 5: 323-364 (1917). Bibl. footnotes.

DAVIES, G. M. Tin ores. London, Murray, 1919. 111 p. Bibl., p. 100-111. 227 entries.

DITTE, ALFRED. L'étain et ses composés. In Frémy, Enc. chim. 3, 11^e cahier: 287-294 (1884).

ENGEL, R. Étain. In Moissan, Chim. min. 2: 571-654 (1905). 666 footnotes.

FAWNS, SYDNEY. Tin deposits of the world with a chapter on tin smelting. 3rd ed. London, 1912. 306 p. Bibl., p. 297-301.

GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Tin. (1913-1919.) London, 1922. 98 p. Bibl., p. 87-98.

HESS, FRANK L., and HESS, EVA. Bibliography of the geology and mineralogy of tin. Smithsonian Inst. Pub. No. 1987, 1912. 408 p. 1701 references, covering 1630-1910.

HESS, FRANK L., and GRATON, L. C. The occurrence and distribution of tin. U. S. Geol. Sur., Bull. No. 260, 1905. Bibl., p. 182-187. 94 references.

HORNOR, R. R. Bibliography of recent articles on tin. U. S. Bur. Mines, Repts. of Investigations, Nov., 1919. 8 p.

KERN, EDWARD F. The electrolytic refining of tin. Trans. Am. Electrochem. Soc. 38: 143-166 (1920). References through text.

LOTTERMOSER, —. Kolloides Zinn. In Abegg, Handb. anorg. Chem. 3, pt. 2: 900 (1909). 30 references.

MENNICKE, HANS. Fortschritte in der Metallurgie des Zinns, 1906-1911. Elektrochem. Z. 13: 258-262; 14: 8-11; 51 references. 15: 78-81, 101-102, 123-124 (1909); 87 references. 16: 292-296, 318-320 (1910); 92 references. 19: 31-34, 67-69, 98-102, 126-128, 158-159, 184-188 (1913). Bibl. footnotes and patents.

PENZER, N. M. The tin resources of the British Empire. London, Rider, 1921. 358 p. Bibl., p. 294-342.

PETERS, F. Die Elektrometallurgie des Zinns. Glückauf 53: 521, 533, 549, 573, 590, 601, 621 (1917); 56: 1019-1022 (1920). Bibl. footnotes.

SCHLENK, O. Zinn. In Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 233-388, 968-1020 (1911).

STRENGERS, TH. Zinn. In Abegg, Handb. anorg. Chem. 3, pt. 2: 600-610 (1909). 380 references.

"Tin and salts." Ind.-Cat. S. G. O., 1st ser., 14: 563-564 (1893); 2nd ser., 18: 276 (1913).

TIN: Alloys.

SCHLENK, O. [Tin alloys.] *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 349-388 (1911).

VIVIAN, A. C. Tin-phosphorus alloys. *J. Inst. Metals* 23: 360 (1920). 10 references.

See also ALLOYS.

TIN: Analytical.

HALLETT, R. L. The volumetric determination of tin. *J. Soc. Chem. Ind.* 35: 1089 (1916). 40 references.

HOFFMANN, MARCUS. Beiträge zur Kenntniss der analytischen Chemie des Zinns, Antimons und Arsens. Berlin, Ebering, 1911. 54 p. Bibl., p. 53-54.

SCHLENK, O. Nachweis, Bestimmung und Trennung des Zinns. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 258-263; 975-976 (1911).

TIN: Organic compounds.

MEYER-JACOBSON. Verbindungen des Zinns. *In their* Lehrb. org. Chem. 1, pt. 1: 448-453 (1907).

SCHWARZHOFF, VICTOR. Additionsprodukte der Zinnhalogenide an Carbonylverbindungen. Dissertation, Zürich, 1912. Bibl., p. 11-41. Classified by organic groups.

TINCTURES

"Tinctures." *Ind.-Cat. S. G. O.*, 1st ser., 14: 564 (1893); 2nd ser., 18: 276-277 (1913).

See also DRUGS, PHARMACEUTICALS.

TIRES

KONSTANZER, MARCIA B. Automobile tires. A list of references in the New York Public Library, *Bull. N. Y. Public Library*, Feb., 1923: 124-146.

TISSUES

ARON, HANS. Die anorganischen Bestandteile des Tierkörpers. *In* Oppenheimer, Handb. Biochem. 1: 62-90 (1909). 186 footnotes. 2nd ed., 1: 1-32 (1924). 239 footnotes.

PAULI, W. Allgemeine Physico-chemie der Zellen und Gewebe. *Ergeb. Physiol.* 1: 1-2 (1902). 29 references.

"Physical chemistry of the tissues." *Ind.-Cat. S. G. O.*, 2nd ser., 18: 292-293 (1913).

ROSEMANN, R. Ueber den Gesamtchloregehalt des tierischen Körpers. *Arch. ges. Physiol.* 135: 177-195 (1910). Bibl. footnotes.

TITANIUM

ANDERSON, R. J. The metallurgy of titanium. *J. Franklin Inst.* 184: 891-900 (1917).

ANDERSON, R. J. Titanium. *U. S. Bur. Mines, Repts. of Investigations*, No. 2406, 1922. 29 references.

CAVEN, R. M. Titanium. *In* Friend, Textbook, 5: 232-259 (1917). Bibl. footnotes.

DEFOCOZ, ED. Titane. *In* Moissan, *Chim. min.* 2: 489-529 (1905). 320 footnotes.

HAAS, GUSTAV. Titan. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1-100, 1201-1240 (1912).

HALEN, S. Die Herstellung von Titansäure und anderen Titanverbindungen. *Edel-Erden u. -Erze*, 1: 27-29, 43-45 (1919). References through text.

HALEN, S. Die Verwendung des Titans und seiner Verbindungen. *Edel-Erden u. -Erze* 1: 237-242 (1920).

HALLOCK, EDWARD J. Index to the literature of titanium. 1783-1873. *N. Y. Acad. Sci.* 1: 53-76 (1877).

JACOBY, —. Titan. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 456-461 (1909). 307 references.

ROBINSON, A. H. A. Titanium. Canada, Dept. Mines, Mines Br., Pub. No. 579, 1922. 127 p. Bibl., p. 36-38; bibl. footnotes.

STOUGHTON, BRADLEY. Notes on titanium and on the cleansing effect of titanium on cast iron. *Trans. Am. Inst. Mining Eng.* 44: 306-312 (1912); *Bull.*, No. 71: 1335-1341 (1912); *Ferrum* 11: 15-20 (1913). 130 references, covering history, occurrence, properties, effect on steel, manufacture and effect on cast iron.

WATSON, THOMAS L., and TABER, STEPHEN. Bibliography on titanium. *In* Va. Geol. Sur., *Bull.* No. 3-A, p. 290-297 (1913).

TITANIUM: Analytical.

HAAS, GUSTAV. Titan-Analytisches. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 22-26, 1212-1215 (1912).

MARDEN, J. W. Analytical methods for titanium. *In* U. S. Bur. Mines, *Bull.* No. 212, p. 299-300. 32 references.

PETERS, K. Die Analysenmethoden zur Bestimmung und Trennung der Titansäure. *In* Doelter, Handb. Mineralchem. 3, pt. 1: 3-14 (1918). Bibl. footnotes.

TITANIUM CHLORIDES

HAAS, GUSTAV. Titan und Chlor. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 57-68, 1225-1229 (1912).

MACH, F. Die Verwendung von Titantrichlorid in der analytischen Praxis. *Landw. Vers.-Sta.* 90: 191-224 (1917). Bibl. footnotes.

TITANIUM OXIDES

HAAS, GUSTAV. Titan und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 29-45, 1215-1220 (1912).

DOELTER, C. Titandioxyd. In Doelter, Handb. Mineralchem. 3, pt. 1: 14-38 (1918). Bibl. footnotes.

See also RUTILE.

TOBACCO

JENKINS, E. H. Studies on the tobacco crop of Connecticut. Conn. State Agr. Expt. Sta., Bull. No. 180, 1914. 65 p. 92 references.

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Tabakchemie. Chem.-Ztg. 24: 488-489 (1900); 20 footnotes. 26: 426-428 (1902); 30 references. 28: 453-454 (1904); 22 references. 30: 483-484 (1906); 30 references. 32: 717-718 (1908); 26 footnotes. 34: 486-488 (1910); 35 references. 36: 1321-1323 (1912); 60 footnotes. 39: 873-875 (1915); 60 footnotes. 44: 265-267 (1920); 99 footnotes.

THURSTON, AZOR. Cigarettes and their analysis. Agr. Com. Ohio, Bur. Drugs, Bull. No. 2, 1914.

"Tobacco." Ind.-Cat. S. G. O., 1st ser., 14: 581-586, 590-592 (1893); 2nd ser., 18: 297-303 (1913).

WOLF, J. Der Tabak und die Tabakfabrikate. Leipzig, 1912.

See also FOODS (Vereinbarungen), NICOTINE.

TOLUENE

BAUM, FRITZ. Toluol. In Abderhalden, Biochem. Handl. 1: 231-254 (1911). About 400 footnotes. Includes derivatives.

See also GASOLINE (Howard); HYDROCARBONS.

TOLOUDINE

MEYER-JACOBSON. Toluidin. In their Lehrb. org. Chem. 2, pt. 1: 224-225 (1902).

TOMATO

SANDO, CHARLES E. The process of ripening in the tomato, considered especially from the commercial viewpoint. U. S. Dept. Agr., Bull. No. 859, 1920. 38 p. Bibl., p. 32-35.

TOPAZ

ROSICKY, V. [Crystallography of topaz.] Rozpravy Ceska Akad. 25, No. 22, 1916. 146 references.

See also ALUMINIUM SILICATE, PRECIOUS STONES.

TORBAINITE. See OIL SHALE.

TORMALINE

DOELTER, C. Turmalin. In his Handb. Mineralchem. 2, pt. 2: 749-789 (1917). Bibl. footnotes.

TOXICOLOGY

BIBERFELD. Ergebnisse der experimentellen Toxikologie. I. Anorganische Substanzen. II. Organische Substanzen. Ergeb. Physiol. 12: 1-10 (1912); 17: 2-41 (1919). About 1900 references.

GADAMER, J., and GAEBEL, G. O. Fortschritte der Toxikologie in den Jahren 1903 und 1904. Chem.-Ztg. 29: 545-550 (1905). 168 footnotes.

MANN, JOHN D. Forensic medicine and toxicology. 6th ed. London, Griffin, 1922. 573 p. Bibl. footnotes.

POSNER, THEODOR. Fortschritte auf dem Gebiete der Toxikologie. Chem.-Ztg. 24: 635-639 (1900); 95 footnotes. 25: 665-671 (1901); 159 footnotes.

SHERWIN, CARL P. The fate of foreign organic compounds in the animal body. Physiol. Rev. 2: 238-276 (1922). 107 references.

"Toxicology." Ind.-Cat. S. G. O., 1st ser., 14: 667-686 (1893); 2nd ser., 18: 399-405 (1913).

See also POISONS.

TOXINS

MICHAELIS, LEONOR. Physikalische Chemie der Toxin-antitoxin Bildung. In Oppenheimer, Handb. Biochem. 2: 377-394 (1908). 37 footnotes.

MICHAELIS, LEONOR. Ueber die Gültigkeit des Massenwirkungsgesetzes bei der Reaktion zwischen Toxin und Antitoxin. Biochem. Centr. 3: 1-12 (1904). 58 references.

SACHS, HANS. Tierische Toxine als haemolytische Gifte. Biochem. Centr. 5: 257-268, 305-313 (1906). 56 references.

SAMUELY, FRANZ. Tierische Toxine. In Oppenheimer, Handb. Biochem. 1: 583-598 (1909). 53 footnotes.

SCHLOSSBERGER, HANS, and ISHIMORI, K. Tierische Toxine. In Oppenheimer, Handb. Biochem., 2nd ed., 1: 909-940 (1924). 202 footnotes.

"Toxins and antitoxins." Ind.-Cat. S. G. O., 2nd ser., 18: 405-412 (1913).

TRANSFERENCE NUMBER

BABOROVSKY, GEORGE. A new method to determine the hydration of ions. Rec. trav. chim. 42: 229-239 (1923). Bibl. footnotes.

LANDOLT-BÖRNSTEIN. Überführungszahlen und Ionen-Beweglichkeit. In their Tabellen, 4th ed., 1912, 1125; 5th ed., 1923, 1106.

NOYES, A. A., and FALK, K. G. Electrical transference numbers. J. Am. Chem. Soc. 33: 1436-1460 (1911). Bibl. footnotes.

WALDEN, PAUL. Literatur über die in wässrigen und nichtwässrigen Lösungen nach Hittorf quantitativ bestimmten Überführungszahlen. In his Das Leitvermögen der Lösungen, 1: 220-222 (1924). About 100 references.

TRANSUDATES

GERHARTZ, HEINRICH. Chemie der Transsudate und Exsudate. *In* Oppenheimer, Handb. Biochem. 2, pt. 2: 137-162 (1909). 126 footnotes.

TRIAZINE COMPOUNDS

MEYER-JACOBSON. Triazin-Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 1508-1525 (1920). Bibl. footnotes.

TRIAZOLE COMPOUNDS

MEYER-JACOBSON. 1, 2, 3- und 1, 2, 4-Triazol-Körper. *In their* Lehrb. org. Chem. 2, pt. 3: 561-622 (1916). Bibl. footnotes.

TRIBOLUMINESCENCE

IMHOF, A. Tribolumineszenz. *Pysik. Z.* 18: 78-91 (1917).

TRAUTZ, MAX. Tribolumineszenz. *Ion* 2: 78-80 (1910). 117 references.

See also LUMINESCENCE.

TRICALCIUM ALUMINATE

PHILLIPS, A. J. Colloidal tricalcium aluminate. *J. Am. Ceram. Soc.* 2: 708-742 (1919). 60 footnotes.

TRICARBALLYLIC ACID

MEYER-JACOBSON. Tricarballicsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 453-455 (1913). 43 references.

THIELE, A. Tricarballicsäure. *In* Abderhalden, Biochem. Handl. 1: 1170-1171 (1911). 30 footnotes.

TRICHLOROACETIC ACID

MEYER-JACOBSON. Trichloressigsäure. *In their* Lehrb. org. Chem. 1, pt. 2: 496-498 (1913).

TRIDYMIT

DOELTER, C. Tridymit. *In his* Handb. Mineralchem. 2, pt. 1: 190-198 (1914). Bibl. footnotes.

JACOBY, R. Tridymit. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 135 (1912).

See also SILICA.

TRIGONELLIN. *See* CHOLINE.**TRIMETHYLAMINE.** *See* AMINES, BASES.**TRIMETHYLENE**

MEYER-JACOBSON. Trimethylen- oder Cyclopropangruppe. *In their* Lehrb. org. Chem. 2, pt. 1: 16-22 (1895).

See also HYDROCARBONS.

TRINITROANISOL

DESVERGNES, M. L. Le trinitroanisole et le trinitrophenetol. *Mem. poudres* 19: 269-270 (1922). 19 references.

See also EXPLOSIVES.

TRINITROTOLUENE

HOFFMAN, E. J. The nitration of toluene. *U. S. Bur. Mines, Tech. Paper No.* 146, 1916. 31 p. Bibl., p. 28-31. 62 references.

See also EXPLOSIVES; POISONS, INDUSTRIAL.

TRIONAL

"Trional." *Ind.-Cat. S. G. O.*, 2nd ser., 18: 491-492 (1913).

See also SEDATIVES.

TRIPHENYLMETHANE

LIEBIG, HANS V. Studien in der Tritanreihe. *Ann.* 360: 128-264 (1908). 75 footnotes.

See also HYDROCARBONS.

TRIPOLI

LADOO, R. B. Mining and preparation of tripoli. *U. S. Bur. Mines, Repts. of Investigations*, No. 2190, 1920. 13 references.

See also ABRASIVES, DIATOMACEOUS EARTH.

TRITHIONIC ACID

LINNE, BR. Trithionsäure. *In* Gmelin-Kraut, Handb. anorg. Chem. 1, pt. 1: 599-604 (1907).

TRONA. *See* SODIUM CARBONATE.**TROPACOCAINE**

"Tropacocaine." *Ind.-Cat. S. G. O.*, 2nd ser., 18: 500-501 (1913).

TROPINE

MEYER-JACOBSON. Tropin. *In their* Lehrb. org. Chem. 2, pt. 3: 1065-1068 (1918).

SCHMIDT, JULIUS. Tropin (Tropanol). *In* Abderhalden, Biochem. Handl. 5: 53-59 (1911). Bibl. footnotes.

WILLSTÄTTER, RICHARD. Synthesen in der Tropingruppe. I. Synthese des Tropilidens. *Ann.* 317: 204-265 (1901). 75 footnotes.

TRYPFLAVINE. *See* QUININE (Lacquer).**TRYPSIN**

EFFRONT, J. Bibliography on trypsin. *In his* Biochemical catalysts in life and industry, p. 364-370, 457-460 (1917).

"Trypsin." *Ind.-Cat. S. G. O.*, 1st ser., 14: 797 (1893); 2nd ser., 18: 535-536 (1913).

WALTERS, E. H. Hydrolysis of casein by trypsin. *J. Biol. Chem.* 11: 267-304 (1912). 80 footnotes.

ZUNZ, EDGARD. Trypsin. *In* Abderhalden, Biochem. Handl. 5: 587-595 (1911). 180 footnotes.

See also ENZYMES.

TRYPTOPHANE

MEYER-JACOBSON. Tryptophan. *In their* Lehrb. org. Chem. 2, pt. 3: 273-277 (1915). Bibl. footnotes.

PORCHER, CH. Das Tryptophan. *Biochem. Centr.* 9: 725-740 (1910). 79 references.

"Tryptophan." *Ind.-Cat. S. G. O.*, 2nd ser., 18: 538 (1913).

WINTERSTEIN, E., and TRIER, G. Tryptophan. *In* Abderhalden, Biochem. Handl. 4: 703-711 (1911); 9: 148-151 (1915). About 140 footnotes.

TUBERCULOSIS

WELLS, HARRY G., DE WITT, L. M., and LONG, E. R. The chemistry of tuberculosis; being a compilation and critical review of existing knowledge on the chemistry of the tubercle bacillus and its products; the chemical changes and processes in the host; the chemical aspects of the treatment of tuberculosis. Baltimore, Williams, 1923. 447 p. Bibl. footnotes.

TUMORS

NEUBERG, CARL. Chemie der Neubildungen. In Oppenheimer, Handb. Biochem. 2, pt. 2: 377-385 (1909). 52 footnotes.

WELLS, H. G. The chemistry of tumors. In his Chemical pathology, 4th ed., p. 497-527 (1920). 245 footnotes.

TUNG OIL

SCHUMANN, C. L. Polymerization of Chinese wood oil. J. Ind. Eng. Chem. 8: 5-15 (1916). 45 footnotes.

STEVENS, GEORGE H., and ARMITAGE, J. W. Patents, technology and bibliography of China wood oil (Tung oil). For use as a reference book of the oil, varnish, rubber, linoleum and kindred industries. 1914. Manuscript edition in 2 vols. of 2 parts each. 135 p. 800 references and 200 patents.

TUNGSTEN

ALTERTHUM, HANS. Wolfram; Fortschritte in der Herstellung und Anwendung in den letzten Jahren. Braunschweig, Vieweg, 1925. 111 p. "Good review of the literature."

DEFAEOZ, Ed. Tungstene. In Moissan, Chim. min. 4: 759-848 (1905). 540 footnotes.

FINK, COLIN G. Tungsten. Mineral Ind. 25: 720-743 (1916); 26: 698-719 (1917); 27: 715-736 (1918); 28: 688-709 (1919); 29: 681-704 (1920); 30: 691-705 (1921). 136 references.

FISCHER, A. Beiträge zur Elektrochemie der Chromgruppe. I. Wolfram und Uran. Z. anorg. Chem. 81: 170-208 (1912). Bibl. footnotes.

GR. BRIT. Imperial mineral resources bureau. Mineral industry of the British Empire and foreign countries. War period. Tungsten. (1913-1919.) London. 44 p. Bibl., p. 36-44.

HALEN, S. Die Verwendung des Wolframs und seiner Verbindungen. Edel-Erden u. -Erze 1: 181-184, 191-193, 198-200 (1920). References through text.

HARTMANN, M. L. A bibliography of tungsten. S. Dak. School Mines, Bull. No. 12, 1918. 1328 references,

1574-1918. Classified by subject, including preparation, properties, uses, compounds, analytical and occurrence. In part in Pahaska Quart. 5: 25-34 (1916).

HESS, FRANK L. Tungsten. U. S. Geol. Sur., Mineral Resources, 1916, pt. 1: 801-803; 1917, pt. 1: 947-954; 1918, pt. 1: 1014-1026.

JANDER, G. Kolloidchemie des Wolframs. In Abegg, Handb. anorg. Chem. 4, pt. 1, 2nd half: 867-868 (1919). 17 references.

JEFFRIES, ZAY. The metallography of tungsten. Trans. Am. Inst. Mining Eng. 60: 627-629 (1919); Bull. No. 138: 1076-1078 (1918). 38 references.

JOLY, M. A. Tungstène. In Frémy, Enc. chim. 3, 7^e cahier: 254-256 (1888).

KIESER, A. J. Wolfram. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 702-874, 1395-1444 (1912).

KOERNER, WALTER E. Electrolytic behavior of tungsten. Met. Chem. Eng. 16: 47 (1917); Trans. Am. Electrochem. Soc. 31: 246-247 (1917). 40 references.

KOPPEL, I. Wolfram. In Abegg, Handb. anorg. Chem. 4, pt. 1, 2nd half: 851-860 (1919). 339 references, 1779-1919.

MENNICKE, HANS. Metallurgie des Wolframs. Berlin, Krayn, 1911. 416 p. 50 references, p. 401-404; 75 patents, p. 405-407.

MENNICKE, HANS. Fortschritte in der Metallurgie des Wolframs in den Jahren 1911 bis 1913. Chem.-Ztg. 38: 511, 569, 631, 666 (1914). 91 footnotes.

RASTALL, R. H., and WILCOCKSON, W. H. Tungsten ores. London, Murray, 1920. 81 p. Bibl., p. 77-80. 130 references.

U. S. Tariff Commission. Tungsten. In its Tariff information survey No. 21, 1920, p. 318-320. 54 references.

VAN WEGENEN, H. R. Tungsten. Chem. Eng. 4: 290-297 (1906), 110 references. Also in Colorado School Mines, Bull. 3, No. 2: 165-169 (1906).

TUNGSTEN: Analytical.

DAVIS, C. W. Analytical methods for tungsten. In U. S. Bur. Mines, Bull. No. 212, p. 167-172 (1923). 124 references.

KIESER, A. J. Wolfram—Analytisches. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 715-718, 1402-1403 (1912).

TUNGSTEN CHLORIDES

KIESER, A. J. Wolfram und Chlor. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 753-757, 1412 (1912).

TUNGSTEN OXIDES

KAUSCH, O. Herstellung vom Wolframsäure. Edel-Erden u. Erze 1: 97-99 (1920). References through text.

KIESER, A. J. Wolframtrioxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 722-736 (1912).

TURPENTINE

LEIMBACH, R. Terpentinöl. *In* Abderhalden, Biochem. Handl. 7: 559-563 (1912). 125 footnotes.

SALVATERRA, H. Ueber neue Methoden zur Terpentinöluntersuchung. Chem.-Ztg. 45: 133-135, 150-151, 158-159 (1921). 80 footnotes.

"Terebinthina (turpentine)." Ind.-Cat. S. G. O., 1st ser., 13: 310-312 (1893); 2nd ser., 17: 747-748 (1912).

WORDEN, E. C. Turpentine substitutes. *In his* Technology of cellulose esters 1: 2568-2572 (1921). Bibl. footnotes. See also RESINS.

TURQUOISE

POGUE, J. E. The turquoise. A study of its history, mineralogy, . . . and technology. Mem. Nat. Acad. Sci. 12, pt. 2: 136-154 (1915). 344 references, 1300-1912.

See also PRECIOUS STONES.

TYROSINE

DODGE, CARROLL WM. Tyrosin in the fungi. Chemistry and methods of studying the tyrosinase reaction. Ann. Mo. Botanical Garden 6: 89-92 (1919).

MEYER-JACOBSON. Tyrosin. *In their* Lehrb. org. Chem. 2, pt. 1: 665-667 (1902). Bibl. footnotes.

"Tyrosine." Ind.-Cat. S. G. O., 1st ser., 14: 918 (1893); 2nd ser., 18: 1054-1055 (1913).

WINTERSTEIN, E., and TRIER, G. Tyrosin. *In* Abderhalden, Biochem. Handl. 4: 681-694 (1911); 9: 134-139 (1915). About 300 footnotes.

See also AMINO ACIDS.

ULTRAFILTRATION

BECHHOLD, H. Ultrafiltration. *In* Abderhalden, Handb. biol. Arbeitsm. 3B: 333-350 (1922). Bibl. footnotes.

OSTWALD, WOLFGANG. Zur Theorie der Osmose und Ultrafiltration kolloider Lösungen. Kolloid-Z. 23: 68-78 (1918). 46 references.

ULTRAMARINE

DOELTER, C. Allgemeines ueber natürliches und künstliches Ultramarin. *In his* Handb. Mineralchem. 2, pt. 2: 295-305 (1917). Bibl. footnotes.

EISENREICH, KURT. Das künstliche Ultramarin. *In* Doelter, Handb. Mineralchem. 2, pt. 2: 286-295 (1917). Bibl. footnotes.

JACOBY, R. Ultramarin. *In* Gmelin-Kraut, Handb. anorg. Chem. 3: pt. 1: 281-282, 1306-1309 (1912).

LEENT, F. H. VAN. [Ultramarine.] *Olien en Vetten* 5: 15-17, 30-31 (1920).

LITTLE, H. F. V. Ultramarine. *In* Friend, Textbook 4: 135-142 (1917). Bibl. footnotes.

ROHLAND, —. Ultramarin. *In* Abegg, Handb. anorg. Chem. 3, pt. 1: 128 (1906). 29 references.

ULTRAMICROSCOPE

KING, GEORGE. Ultramicroscopy: degree of dispersion, measurement with the ultramicroscope. *In* Third report on colloid chemistry, 1920, p. 40. 62 references.

MELLOR, J. W. Ultramicroscopic particles. Ultramicroscopy. *In his* Inorg. theor. chem. 1: 768-782 (1922). 400 references.

OSTWALD, WOLFGANG. Die Untersuchungen der Elektrolyse mit dem Ultramikroskop. Kolloid-Z. 7: 132-155 (1910). 73 footnotes.

SIEDENTOPF, H. Ultramikroskopische Literatur. Kolloid-Z. 1: 173-176, 271-272 (1906-1907). 81 references.

"Ultramicroscope." Ind.-Cat. S. G. O., 2nd ser., 19: 28-29 (1914).

See also COLLOIDS.

ULTRAVIOLET LIGHT

BEHRENS, W. B. Ultraviolet rays. *In* New York Public Library, Bull. 19: 495-507 (1915). 317 references. Chronological with subject index.

ELLIS, CARLETON, and WELLS, A. A. Ultraviolet light; its application in chemical arts. Chem. Eng. 25: 2, 54, 95, 148, 188, 232, 311 (1918); 26: 28, 66, 113, 143, 181, 219, 263, 291, 343, 385, 392, 425, 432, 437, 463, 473, 505, 521 (1919); 27: 19, 49, 73, 102 (1920). References through text.

HOUGHTON, E. M., and DAVIS, LEWIS. Study of the germicidal action of the ultraviolet rays. Am. J. Pub. Health 4: 240 (1914). 32 references.

"Ultraviolet light; its uses and possibilities." Gen. Elec. Rev. 25: 323-324 (1922).

ZEISS, CARL. Verzeichnis der bis zum Ende 1912 erschienenen Literatur ueber mikroskopische Untersuchung mit ultraviolettem Licht. 6 p.

UNSATURATED COMPOUNDS

BAUER, H. Methoden zum Nachweis und zur Erkennung ungesättigter Verbindungen. *In* Abderhalden,

Handb. biol. Arbeitsm. 1, pt. 1: 463-542 (1921). Bibl. footnotes.

HINRICHSSEN, F. WILLY. Zur Kenntniss der ungesättigten Verbindungen. Ann. 336: 168-227, 323-344 (1904). 100 footnotes.

U. S. BUREAU OF MINES

POWELL, FRED W. The Bureau of Mines, its history, activities and organization. New York, Appleton, 1922. 162 p. Bibl., p. 146-160.

U. S. GEOLOGICAL SURVEY

INSTITUTE FOR GOVERNMENT RESEARCH. The U. S. Geological Survey, its history, activities and organization. New York, Appleton, 1919. 163 p. Bibl., p. 133-156.

U. S. PUBLIC HEALTH SERVICE

SCHMECKEBIER, LAURENCE F. The Public Health Service, its history, activities and organization. Baltimore, Johns Hopkins Press, 1923. 298 p. Bibl., p. 273-292.

URACIL. See PYRIMIDINES.

URANIUM

ALOY, —. Uranium. In Moissan, Chim. min. 4: 849-902 (1905). 347 footnotes.

BOLTON, HENRY C. Index to the literature of uranium, 1789-1885. Smithsonian Inst., Annual Rept., 1885, p. 915-946. Misc. Pub. No. 628. 36 p. Revision of article in Annals Lyceum Nat. Hist. 9: 362-376 (1870). Chronological; classified by subjects at end of bibl.

DITTE, ALFRED. L'uranium et ses composés. In Frémy, Enc. chim. 3, 11^e cahier: 111-114 (1884).

GEORGE, R. D. A bibliography of uranium and vanadium. Mining Sci. 63: 241 (1911). 57 references, 1890-1910.

HAAS, GUSTAV, and KIESER, A. J. Uran. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1044-1200, 1530-1568 (1912). References through text.

HESS, FRANK L. Radium, uranium and vanadium. U. S. Geol. Sur., Mineral Resources, 1915, pt. 1: 835-836.

MEREN, P. Die Verwendung des Urans und seiner wichtigsten Verbindungen. Edel-Erden und -Erze 1: 145-148, 167 (1920). References through text.

MEYER, R. J. Uran. In Abegg, Handb. anorg. Chem. 4, pt. 1, 2nd half: 965-973 (1920). 409 references.

MEYER, STEFAN. Bericht ueber das Uran und seine ersten Zerfallsprodukte. Jahrb. Radioakt. Elektronik 6: 381-387 (1909). 143 references.

"Uranium and compounds." Ind.-Cat. S. G. O., 1st ser., 15: 45 (1894); 2nd ser., 19: 164-165 (1914).

See also RADIUM.

URANIUM: Analytical.

DAVIS, C. W. Analytical methods for uranium. U. S. Bur. Mines, Bull. No. 212, p. 234-237 (1923). 83 references.

HAAS, G., and KIESER, A. J. Uran—Analytisches. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1055-1058, 1536-1537 (1912).

KERN, E. F. Quantitative separation and determination of uranium. J. Am. Chem. Soc. 22: 685-726 (1901). Bibl. footnotes.

URANIUM: Complex compounds.

MÜLLER, ARNO. Studien ueber die Komplexbildung von Uranylverbindungen. Z. anorg. allgem. Chem. 103: 55-68 (1918). List of compounds with literature references.

URANIUM: Radioactivity.

LUCAS, RICHARD. Uranaktivität. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 9-11 (1908).

URANIUM CHLORIDE

HAAS, GUSTAV, and KIESER, A. J. Uranchloride. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1111-1119 (1912).

URANIUM NITRATE

HAAS, GUSTAV, and KIESER, A. J. Urannitrate. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1079-1084 (1912).

URANIUM OXIDES

HAAS, GUSTAV, and KIESER, A. J. Uran und Sauerstoff. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1058-1078 (1912).

URANIUM SALTS

NICHOLS, EDWARD L., and HOWES, HORACE L. Chemistry of fluorescing uranyl salts. In Carnegie Inst. Pub. No. 298, p. 207-230 (1919). Bibl. footnotes.

URANIUM SULFATE

HAAS, GUSTAV, and KIESER, A. J. Uransulfate. In Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 1: 1092-1100 (1912).

URAZOLE

MEYER-JACOBSON. Urazol. In their Lehrb. org. Chem. 2, pt. 3: 603-609 (1916). Bibl. footnotes.

UREA

JACOBY, M. Ueber die Harnstoffbildung im Organismus. Ergeb. Physiol. 1: 532-533 (1902). 75 references.

LEITER, LOUIS. Relation of urea to uremia. Arch. Inter. Med. 28: 331-354 (1921). 47 footnotes.

UREA—Cont'd

MEYER-JACOBSON. Carbamid (Harnstoff). *In their* Lehrb. org. Chem. 1, pt. 2: 1381-1407 (1913). Bibl. footnotes.

RONA, PETER. Harnstoff. *In* Abderhalden, Biochem. Handl. 4: 765-782 (1911); 9: 167-186 (1915). Bibl. footnotes (includes derivatives).

"Urea." Ind.-Cat. S. G. O., 1st ser., 15: 46-52 (1894); 2nd ser., 19: 166-172 (1914).

WERNER, EMIL A. The chemistry of urea, the theory of its constitution and of the origin and mode of formation in living organisms. London, Longmans, 1923. 212 p. Bibl., p. 201-209. Chronological, 1773-1922.

ZEMPLÉN, GÉZA. Harnstoff und Derivate. *In* Abderhalden, Biochem. Handl. 11: 204-242 (1924). Bibl. footnotes.

UREAS: Oxygen ethers.

McKEE, RALPH H. On the oxygen ethers of the ureas: methyl- and ethylisourea. *Am. Chem. J.* 26: 209-264 (1901). Bibl. footnotes.

UREASE

LÖUGREN, STURE. Studien über die Urease. *Biochem. Z.* 119: 283-293 (1921). 212 references.

SPILLMANN, HENRI. Nouvelles recherches sur l'urease. Thesis, Geneva, 1922. 31 p. Bibl., p. 29-31.

THOMS, H. Urease. *Ber. pharm. Ges.* 30: 175-178 (1920).

See also AMIDASE, ENZYMES.

URETHANE

MEYER-JACOBSON. Carbamidsäureester (Urethan). *In their* Lehrb. org. Chem. 1, pt. 2: 1371-1381 (1913). Bibl. footnotes.

URIC ACID

BENEDICT, STANLEY R. Uric acid in its relation to metabolism. *J. Lab. Clin. Med.* 2: 1-15 (1916). 30 references.

BRAHM, C., and SCHMIDT, J. Harnsäure. *In* Abderhalden, Biochem. Handl. 4: 1093-1130 (1911); 9: 293-311 (1915). About 350 footnotes.

BURIAN, RICHARD, and SCHUR, HEINRICH. Ueber die Stellung der Purinkörper im menschlichen Stoffwechsel. *Arch. ges. Physiol.* 80: 241-343 (1900); 87: 239-354 (1901). Bibl. footnotes.

FOLIN, OTTO, BERGLUND, HILDING, and DERICK, CLIFFORD. The uric acid problem. An experimental study of animals and man, including gouty subjects. *J. Biol. Chem.* 60: 361-471 (1924). 64 footnotes on p. 361-373.

HANZLIK, PAUL J. Piperazine and other organic urate solvents. *J. Lab.*

Clin. Med. 2: 308-327 (1917). 85 references.

HØST, HERMAN F. Bidrag til den endogene urinsyres fysiologi. Thesis, Kristiania, 1917. 132 p. Bibl., p. 125-132.

JUNG, A. Ueber den Einfluss der Wasserstoffionenkonzentration und die Löslichkeit der Harnsäure. *Helvetica Chim. Acta* 6: 562-593 (1923). Bibl. footnotes.

McCLURE, C. W., and PRATT, J. H. Uric acid in gout. *Arch. Inter. Med.* 20: 481-514 (1917). 58 footnotes.

McCRUDEN, F. H. Uric acid: The chemistry, physiology and pathology of uric acid and the physiologically important purine bodies. New York, Hoeber, 1906. 318 p. Numerous bibl. footnotes.

MEYER-JACOBSON. Harnsäure. *In their* Lehrb. org. Chem. 2, pt. 3: 1301-1320 (1920).

THANNHAUSER, S. J. Harnsäure. *In* Abderhalden, Biochem. Handl. 10: 127-131 (1923). 37 footnotes.

"Uric acid." Ind.-Cat. S. G. O., 1st ser., 1: 94-95 (1880); 15: 124-127 (1894); 2nd ser., 19: 243-250 (1914).

WELLS, H. G. Uric acid metabolism and gout. *In his* Chemical Pathology, 4th ed., p. 626-641 (1920).

WIENER, HUGO. Die Harnsäure. *Ergeb. Physiol.* 1: 555-566 (1902); 302 references.

WIENER, HUGO. Die Harnsäure in ihrer Bedeutung für die Pathologie. *Ergeb. Physiol.* 2: 377-382 (1903). 165 references.

URICASE. *See* METABOLISM (Alperin).

URINE

DEHN, WM. M., and HARTMAN, F. A. The volatile substances of urine. *J. Am. Chem. Soc.* 36: 2118-2136 (1914). Bibl. footnotes.

ELLINGER, ALEXANDER. Chemie des normalen Harns. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 536-640 (1910). 536 footnotes.

ELLINGER, ALEXANDER. Pathologische Harnbestandteile. *In* Oppenheimer, Handb. Biochem. 3, pt. 1: 641-676 (1910). 167 footnotes.

HEFFTER, A. Die Ausscheidung körperfremder Substanzen im Harn. I. Anorganische Verbindungen. II. Organische Verbindungen. *Ergeb. Physiol.* 2: 95-102 (1903); 4: 185-208 (1905). 190 and 632 references.

HEFFTER, A. Chemie des Harns. *Ergeb. Physiol.* 1: 438-441 (1902). 87 references.

KLEINMANN, HANS. Bestimmung des allgemeinen physikalischen Verhaltens des Harns. *In* Abderhalden,

Handb. biol. Arbeitsm. 4, pt. 5: 1-112 (1923). Bibl. footnotes.

MITCHELL, H. H., SHONLE, H. A., and GRINDLEY, H. S. The origin of the nitrates in the urine. *J. Biol. Chem.* 24: 461-490 (1916). 33 footnotes.

MYERS, VICTOR C. Excretions. *In* Barker, *Endocrinology and metabolism*, 3: 481-513; references, 5: 345-509 (1922).

NEUBAUER-HUPPERT. *Analyse des Harns*. Wiesbaden, Kreidel, 1910-1913. 2 vols. Discusses all the constituents of the urine with footnotes.

NEUBERG, CARL. *Der Harn, sowie die übrigen Ausscheidungen und Körperflüssigkeiten*. Berlin, Springer, 1911. 2 vols. Bibl. footnotes.

PINCUSOHN, LUDWIG. *Physikalische Chemie des Harns*. *In* Oppenheimer, *Handb. Biochem.* 3, pt. 1: 684-708 (1910). 109 footnotes.

QUERNER, E., and WEISE, W. Untersuchungen der Harnsedimente. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 5: 121-186 (1923). Bibl. footnotes.

SALANT, WM., and HINKEL, F. C. Influence of alcohol on the composition of urine. *J. Pharmacol.* 1: 493-512 (1910). 75 references.

SPIRO, K., and VOGT, H. Physiologie der Harnabsonderung. *Ergeb. Physiol.* 1: 414-417 (1902). 96 references.

"Urine." *Ind.-Cat. S. G. O.*, 1st ser., 15: 135-191 (1894); 2nd ser., 19: 278-350 (1914). Includes the following subjects: acetone, acidity, albumin, amino acids, ammonia, chemistry, chlorides, creatine and creatinine, cryoscopy, cystine, diazo reaction, Cammidge's text, examination and analysis, glucuronic acid, hematoporphyrin, indican, indole, indoxyl, iodine and iodides, levulose, mercury, nitrogen and compounds, oxalic acid and oxalates, pentoses, phosphates, proteins, sulfur and sulfates, xanthine bases.

WEISS, OTTO. *Der Harn*. *In* Nagel, *Handb. der Physiologie des Menschen*, 2: 336-384 (1906). Bibl. footnotes.

URINE: Pigments.

MÜLLER, FRANZ. Die Harnfarbstoffe. *In* Oppenheimer, *Handb. Biochem.* 1: 736-742 (1909). 25 footnotes.

SAMMUELY, FRANZ. Gruppe der Harnfarbstoffe. *In* Abderhalden, *Biochem. Handl.* 6: 361-378 (1911). About 200 footnotes.

SCHULZ, N. Ueber einige Farbstoffe des Harns, ihre Entstehung und

Bedeutung. *Ergeb. Physiol.* 2: 159-162 (1903). 76 references.

"Urine, bile and bile pigments in." *Ind.-Cat. S. G. O.*, 2nd ser., 19: 291-292 (1914).

"Urine, pigments in." *Ind.-Cat. S. G. O.*, 1st ser., 15: 151-153 (1894); 2nd ser., 19: 336-337 (1914).

URINE: Sugar.

CLAUSNIZER, F. Zur Bestimmung des Harnzuckers. *Arch. ges. Physiol.* 162: 159-186 (1915). Bibl. footnotes.

HöST, H. F. The urine sugar and its relation to the blood sugar. *J. Metabolic Research* 4: 413-414 (1924). 64 references.

MÜLLER, ERNST J. Untersuchungen ueber die Verwendbarkeit der Merck'schen Reagenztabletten zur quantitativen Zuckerbestimmung in Tierharne. Dissertation, Bern, 1908. 45 p. Bibl., p. 39-41.

"Sugar in urine." *Ind.-Cat. S. G. O.*, 1st ser., 15: 167, 174-177 (1894); 2nd ser., 19: 293, 347-353 (1914).

UROBILIN

BAUMANN, LOUIS. Urobilin and urobilinogen. *In* Barker, *Endocrinology and metabolism*, 3: 163-169; references, 5: 345-509 (1922).

"Urobilin." *Ind.-Cat. S. G. O.*, 1st ser., 15: 191-192 (1894); 2nd ser., 19: 361-363 (1914).

"Urobilinogen." *Ind.-Cat. S. G. O.*, 2nd ser., 19: 363-364 (1914).

WILBUR, RAY L., and ADDIS, THOMAS. Urobilin, its clinical significance. *Arch. Inter. Med.* 13: 281-286 (1914).

UROTROPINE

"Urotropine." *Ind.-Cat. S. G. O.*, 2nd ser., 19: 367-369 (1914).

See also HEXAMETHYLENETETRAMINE.

USNIC ACID

WIDMAN, OSKAR. Zur Kenntniss der Usninsäure. *Ann.* 324: 139-200 (1902). 32 footnotes.

VALENCE

ABEGG, R. Die Valenz und das periodische System. Versuch einer Theorie der Molekularverbindungen. *Z. anorg. Chem.* 39: 330-380 (1904). 80 footnotes.

BILTZ, WILHELM. Ergebnisse und Aufgaben neuerer chemischer Valenzforschung. *Z. angew. Chem.* 33: 313-317 (1920). 36 references.

BILTZ, WILHELM. Zur Frage nach die Temperaturabhängigkeit der Valenz in heterogenen Systemen. *Z. physik. Chem.* 67: 561-593 (1909). 55 footnotes.

BRAUN, J. v. Neuere Forschung ueber den Wechsel der Valenz auf dem Gebiete der organischen Verbind-

VALENCE—*Cont'd*

ungen. Jahrb. Radioakt. Elektronik 1: 49 (1904). 40 references.

CLARK, GEORGE L. Secondary valences in the light of recent researches. I. Inorganic amines. *Am. J. Sci.* (5) 7: 1-23 (1924). Bibl. footnotes.

DUBSKY, J. V. Die Affinitätsabsättigung der Haupt- und Nebenvalenzen in den Verbindungen höheren Ordnung. *J. prakt. Chem.* 198: 61-118 (1914). Bibl. footnotes.

FALK, K. G., and NELSON, J. M. The electron conception of valence. *School Mines Quarterly* 30: 179 (1909); *J. Am. Chem. Soc.* 32: 1637-1654 (1910); 33: 1140-1152 (1911); 35: 1810-1821 (1913); 36: 209-214 (1914); 37: 274-386, 1732-1748 (1915). Bibl. footnotes.

FRIEND, J. NEWTON. The theory of valency. New York, Longmans, 1909. 180 p. Bibl. footnotes.

FRY, H. S. The electronic conception of valence and the constitution of benzene. New York, Longmans, 1921. 297 p. Bibl., p. 294-297.

HENRICHSSEN, F. W. Ueber den gegenwärtigen Stand der Valenzlehre. *Sammlung chem. chem.-tech. Vorträge* 7: 189-282 (1902). Bibl. footnotes.

JONES, L. W. Application of the electronic conception of valence. *Am. Chem. J.* 50: 414-443 (1913). Bibl. footnotes.

KAUFFMANN, HUGO. Die Valenzforschung. *Z. angew. Chem.* 29: 297-301, 308-309 (1916) 86 footnotes. 30: 193-195, 200-203 (1917); 71 footnotes.

KREMAN, ROBERT K. Die Restfeldtheorie der Valenz auf Grund der organischen Molekülverbindungen. *Sammlung chem. chem.-tech. Vorträge* 27: 237-242 (1923). 253 references.

LEWIS, GILBERT N. Valence and the structure of atoms and molecules. New York, Chem. Cat. Co., 1923. 172 p. Bibl., p. 166-167.

MELLOR, J. W. Combination by volume; valency. *In his Inorg. theor. Chem.* 1: 204-227 (1922). 150 references.

MICHAEL, ARTHUR. Valenzhypothese und der Verlauf chemischer Vorgänge. *J. prakt. Chem.* 176: 487-520 (1903). Bibl. footnotes.

NOYES, WM. A. Valences positives et negatives. *Bull. soc. chim.* (4) 35: 425-440 (1924). Bibl. footnotes.

SCHNEIDER, JOH. Ueber die Entwicklung der Lehre von der Valenz. *Z.*

angew. Chem. 20: 1767-1776 (1907). 103 footnotes.

SKRAUP, SIEGFRIED. Additionsreaktionen und Ringspaltung einiger heterocyclischer Verbindungen. Ein Beitrag zur Lehre von der Valenzlinienverteilung. *Ann.* 419: 1-92 (1919). Bibl. footnotes.

STIEGLITZ, JULIUS. Electron conception of valence as applied to organic compounds. *J. Am. Chem. Soc.* 44: 1293-1313 (1922). 50 footnotes.

See also ELECTRONICS.

VALERIC ACID

SCHMIDT, ERNST. Normalvalerinsäure. Pentansäure. *In Abderhalden, Biochem. Handl.* 1: 973-977 (1911). 80 footnotes (includes derivatives).

See also ACIDS, ORGANIC.

VALINE

MEYER-JACOBSON. Valin. *In their Lehrb. org. Chem.* 1, pt. 2: 757-758 (1913). Bibl. footnotes.

ZEMPLÉN, GÉZA. Valin. *In Abderhalden, Biochem. Handl.* 4: 532-537 (1911); 9: 101-102 (1915). About 100 footnotes.

VANADIC ACID

EDGAR, GRAHAM. Reduction of vanadic acid by hydriodic acid. *J. Am. Chem. Soc.* 38: 2369-2377 (1916). 35 references.

See also VANADIUM OXIDES.

VANADIUM

CHILESOTTI, —. Vanadin. *In Abegg, Handb. anorg. Chem.* 3, pt. 3: 784-788 (1907). 196 references.

EPIHRAIM, FRITZ. Das Vanadin und seine Verbindungen. *Sammlung chem. chem.-tech. Vorträge* 9: 189-192 (1904). 200 references.

FESTER, GUSTAV. Die chemische Technologie des Vanadins. *Sammlung chem. chem.-tech. Vorträge* 20: 493 (1914). 20 references. Bibl. footnotes.

FISCHER, SIEGFRIED. Contributions to the knowledge of the electrolysis of aqueous solutions of vanadium salts. *Trans. Am. Electrochem. Soc.* 30: 175-221 (1916). References through text.

GORGEX, R., and LEITMEIER, H. Vanadin. *In Doelter, Handb. Mineralchem.* 3, pt. 1: 820-854 (1918). Bibl. footnotes.

GT. BRIT. Imperial mineral resources bureau. The mineral industry of the British Empire and foreign countries. War period. Vanadium (1913-1919.) London, 1922. 19 p. Bibl., p. 16-19.

HALEN, S. Die Verwendung des Vanadins und seiner Verbindungen. *Edel-*

- Erden u. -Erze 1: 213-216, 222-223 (1920). References through text.
- IMPERIAL INSTITUTE, Vanadium ores. London, Murray, 1924. 72 p. Bibl., p. 66-72.
- KAUSCH, OSKAR. Die Verfahren zur Herstellung der Vanadinsäure und ihrer Salze. Edel-Erden u. -Erze 1: 5, 17-19, 32-33 (1919). Patents and literature through text.
- MONIOTTE, M. Vanadium. *In* Moissan, Chim. min. 2: 98-125 (1905). 256 footnotes.
- PARMENTIER, F. Vanadium. *In* Frémy, Enc. chim. 3, 8^e cahier: 153-154 (1886).
- PRANDTL, WILHELM. Die Literatur des Vanadins, 1804-1905. Leipzig, Voss, 1906. 94 p. 586 references with author and subject index.
- PRANDTL, W. Vanadin. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 54-216 (1908). References through text.
- ROCKWELL, G. J. Index to the literature of vanadium, 1801-1877. N. Y. Acad. Sci. 1: 133-145 (1877).
- "Vanadium and compounds." *Ind.-Cat. S. G. O.*, 1st ser., 15: 580 (1894); 2nd ser., 20: 91 (1915).
- See also URANIUM.
- VANADIUM: Analytical.**
- CONLEY, J. E. Analytical methods for vanadium. *In* U. S. Bur. Mines, Bull. No. 212, p. 278-280. 66 references.
- DITZ, HUGO, and BARDACH, FRIEDRICH. Neue Methode zur jodometrischen Bestimmung des Vanadiums. *Z. anorg. Chem.* 93: 97-136 (1915).
- JANNASCH, PAUL, and HARWOOD, H. E. Ueber die quantitative Analyse von Vanadinverbindungen mittels Tetrachlorkohlenstoff. *J. prakt. Chem.* 205: 93-127 (1917). Bibl. footnotes.
- KLECKI, VALERIAN v. Analytische Chemie des Vanadins. Hamburg, Voss, 1894. 109 references.
- PRANDTL, W. Nachweis, Bestimmung und Trennung des Vanadins. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 70-73 (1908). Classified.
- VANADIUM: Pharmacological.**
- JACKSON, D. E. Pharmacological action of vanadium. *J. Pharmacol.* 3: 478-514 (1912). 77 references.
- VANADIUM CHLORIDE**
- PRANDTL, W. Vanadinchloride. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 117-123 (1908).
- VANADIUM OXIDES**
- PRANDTL, W. Vanadin und Sauerstoff. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 73-92 (1908).
- VANADIUM SULFATE**
- PRANDTL, W. Vanadinsulfate. *In* Gmelin-Kraut, Handb. anorg. Chem. 3, pt. 2: 102-110 (1908).
- VANILLA**
- CHALOT, C., and BERNARD, U. Culture et préparation de la vanille. Paris, Larose, 1920. 219 p.
- DEAN, J. R., and SCHLOTTERBECK, J. O. Vanilla extract. *J. Ind. Eng. Chem.* 8: 709 (1916). 60 references.
- LECOMBE, H., and CHALOT, C. La vanille: sa culture, préparation et commerce de la vanille. Paris, Naud, 1902. 228 p. 58 references.
- "Vanilla and vanillin." *Ind.-Cat. S. G. O.*, 1st ser., 15: 580 (1894); 2nd ser., 20: 96-97 (1915).
- VANILLIN**
- ALEXANDRE, P., and MARTINET, J. Vanilline. *Chimie & Industrie* 7: 251-264T (1922). 98 footnotes.
- MEYER-JACOBSON. Vanillin. *In their* Lehrb. org. Chem. 2, pt. 1: 521 (1896).
- STANISLAUS, V. S. The story of vanillin. *Tea Coffee Trade J.* 44: 702, 704, 860, 862, 864 (1923). Patents on synthetic product.
- WITTE, E. Vanillin. *In* Abderhalden, Biochem. Handl. 1: 837-842 (1911). 110 footnotes (includes derivatives).
- VAPOR PRESSURE**
- LANDOLT-BÖRNSTEIN. Sättigungsdrucke. *In their* Tabellen, 5th ed., 1923, 1339-1340, 1350-1353, 1354, 1378, 1380-1381, 1403-1404.
- LECAT, MAURICE. La tension de vapeur des mélanges de liquides: L'azeotropisme. Brussels, Lamertin, 1918. 319 p. Bibl., p. 217-249; 760 references. Chronological list. p. 250-257. List of substances, p. 199-215.
- RECHENBERG, C. v. Einfache und fraktionierte Destillation in Theorie und Praxis. Leipzig, Schimmel, 1923. 814 p. Bibl. through text and as footnotes; p. 272-308 give references to 489 compounds.
- SMITH, ALEX., and MENZIES, ALAN W. C. Studies in vapor pressure. *J. Am. Chem. Soc.* 32: 898-907, 907-914, 1412-1434, 1434-1447, 1449-1459, 1541-1555 (1910).
- TABLES ANNUELLES. Tensions de vapeur, points d'ébullition ou de sublimation. 1: 62-79, 288-298 (1910); 2: 111-120 (1911); 3: 112-120 (1912); 4: 318-319 (1916-1917). Contains references to all numerical data during those years.
- WILSON, R. E. Some new methods for the determination of the vapor pressure of salt hydrates. *J. Am. Chem. Soc.* 43: 704-725 (1921). 40 footnotes.

VAPOR PRESSURE—Cont'd

ZAWIDZKI, J. v. Ueber die Dampfdrucke binärer Flüssigkeitsgemische. *Z. physik. Chem.* 35: 129-204 (1900). 125 footnotes.

See also AMMONIA, DISTILLATION, EVAPORATION, ETC.

VARNISHES

ANDES, LOUIS E. Neuerungen auf dem Gebiete der Lack- und Firnis-Fabrikation. *Chem.-Ztg.* 24: 927-930 (1900) 50 footnotes. 25: 1050-1052 (1901); 70 footnotes. 26: 598-600 (1902); 63 footnotes. 27: 238-240 (1903); 35 footnotes.

ANDES, L. E. Kunstfirnisse. *Kunststoffe* 8: 205-207, 219-222, 269-271 (1918). Patents.

BOTTLER, MAX. German varnish making, with notes on American varnish and paint manufacture by A. H. SABIN. New York, Wiley, 1912. Bibl., p. 322-329.

BOTTLER, MAX. Ueber Neuerungen in der Analyse und Fabrikation von Lacken und Firnissen. *Chem. Rev. Fett-Harz-Ind.* 13: 190, 216, 246, 268, 294 (1906); 14: 115, 139, 165, 186, 213, 245, 267 (1907); 16: 72, 107, 133, 155, 193 (1909); 17: 73, 102, 131, 159, 183, 209, 229 (1910); 18: 108, 134, 166, 185, 215, 242, 267, 288 (1911); 19: 49, 72, 99, 123, 153, 178 (1912); 20: 50, 79, 102, 134, 156, 183 (1913). Bibl. footnotes.

LIPPERT, W. Ueber Neuerungen in der Analyse und Fabrikation von Lacken und Firnissen. *Chem. Rev. Fett-Harz-Ind.* 9: 51-54, 76-80 (1902); 10: 73-75, 98-100, 122-125 (1903); 11: 147-149, 164-167 (1904); 12: 158-160, 185-187, 205-207 (1905). Bibl. footnotes.

MORRELL, R. S. Varnishes and their components. London, Frowde, 1923. 361 p. Bibl. at end of chapters; also p. 349-350.

WOLFF, HANS. Jahresbericht ueber die Neuerungen in der Lack und Firnis-Chemie und Industrie während dem Jahres 1913. *Chem. Rev. Fett-Harz-Ind.* 21: 71-73, 111-112, 126-128 (1914). Bibl. footnotes.

See also PAINTS, RESINS, ETC.

VENOM

BRAZIL, VITAL. A defesa contra o ophidismo. Sao Paulo, Pocaí, 1911. 152 p. Bibl., p. 133-141. French translation in 1914 by J. Maibon. Bibl., p. 281-302.

MITCHELL, S. WEIR, and REICHERT, EDWARD T. Researches upon the venoms of poisonous serpents. *Smithsonian Inst. Pub. No.* 647, 1886. 186 p. Bibl., p. 159-179.

NOGUCHI, H. Snake venoms. Washington, Carnegie Inst., Pub. No. 111, 1909. 315 p. Bibl., p. 297-306.

PHISALIX-PICOT, MARIE. Animaux venimeux: la fonction venimeuse chez tous les animaux; etc. Paris, Masson, 1922. 2 vols. Bibl. at end of chapters.

"Venoms." *Ind.-Cat. S. G. O.*, 1st ser., 15: 665-666 (1894); 2nd ser., 20: 189-192 (1915).

"Venoms of poisonous serpents." *Ind.-Cat. S. G. O.*, 1st ser., 12: 897-904 (1891); 2nd ser., 15: 472-475 (1910).

WELLS, H. G. Zootoxins. *In his Chemical Pathology*, 4th ed., 141-158 (1920). 100 footnotes.

See also POISONS, ANIMAL.

VENTILATION

"Ventilation." *Ind.-Cat. S. G. O.*, 1st ser., 15: 656-670 (1894); 2nd ser., 20: 192-199 (1915).

WEISMAN, CHARLES. Biochemical studies of expired air in relation to ventilation. Thesis, Columbia Univ., 1913. Bibl., p. 93-97. 74 references.

VERATRINE

"Veratrine." *Ind.-Cat. S. G. O.*, 1st ser., 15: 672-674 (1894); 2nd ser., 20: 201 (1915).

See also ALKALOIDS.

VERONAL

MEYER-JACOBSON. Veronal. *In their Lehrb. org. Chem.* 2, pt. 3: 1198-1199 (1917).

"Veronal." *Ind.-Cat. S. G. O.*, 2nd ser., 20: 212-214 (1915).

See also SEDATIVES.

VESUVIAN. *See* GRANITE.**VINEGAR**

"Vinegar." *Ind.-Cat. S. G. O.*, 1st ser., 15: 760-761 (1894); 2nd ser., 20: 258-259 (1915).

See also ACETIC ACID; BEVERAGES (Nowak); FOODS (Vereinbarung-en).

VISCOSE

MARGOSCHES, B. M. Die Viskose, ihre Herstellung und Anwendung. 2nd ed. Leipzig, 1906. Bibl., lxxxviii p. Includes both patents and periodical literature.

SÜVERN, KARL. Fällbäder für die Herstellung von Viscoseseide. *Kunststoffe* 2: 444-446 (1912); 3: 447-448 (1913); 6: 164-166 (1916). About 60 patents.

WORDEN, E. C. Viscose. *In his Technology of cellulose esters* 1: 3062-3083 (1921). Bibl. footnotes.

See also SILK, ARTIFICIAL; CELLULOSE ESTERS.

VISCOSITY

- CHWOLSON, O. D. Reibung im Inneren der Flüssigkeiten. *In* *his* Lehrb. der Physik. 1, pt. 2: 269-271 (1918).
- DUNSTAN, A. E., and THOLE, F. B. Viscosity of liquids. London, Longmans, 1914. 100 p.
- FLOWERS, A. E. Viscosity measurements and a new viscosimeter. *Proc. Am. Soc. Testing Materials* 14, pt. 2: 613-616 (1914). 80 references.
- HATSCHKE, EMIL. Viscosity of colloids. *In* First report on colloid chemistry, 1917, p. 3-5. 44 references.
- LANDOLT-BÖRNSTEIN. Zähigkeit. *In* *their* Tabellen, 4th ed., 1912, 104-111; 5th ed., 1923, 186-197.
- MATHEWS, J. H., and COOKE, R. D. Viscosity of pure liquids. *J. Phys. Chem.* 18: 574-575 (1914). 28 references.
- PLÜSS, M. Zur Kenntniss der Viskosität und Dichte geschmolzener Metalle und Legierungen. *Z. anorg. Chem.* 93: 1-44 (1915). Bibl. footnotes.
- RABINOVICH, ADOLPH I. Negative viscosity. *J. Am. Chem. Soc.* 44: 954-964 (1922). 50 footnotes.
- TABLES ANNUELLES. Viscosité. 1: 31-41 (1910); 2: 22-32 (1911); 3: 33-45 (1912); 4: 62-98 (1913-1916). Contains references to all numerical data.
- See also* FLUIDITY, FLOUR, PLASTICITY, LUBRICATING OILS (Dunstan).

VITAMINS

- AARON, HANS, and GRALKA, R. Vitamine oder Accessorische Nährstoffe. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 6: 345-410 (1924). 621 footnotes.
- BERG, RAGNAR. Die Vitamine. Kritische Übersicht der Lehre von den Ergänzungstoffen. Leipzig, Hirzel, 1922. 336 p. Bibl., p. 266-306. 1556 references. Translation by E. and C. Paul. New York, Knopf, 1923. 415 p. Bibl., p. 338-389.
- [Bibliography of vitamins.] *Bull. soc. hyg.* 9: 623-632 (1921); 10: 317-328 (1922). Articles other than French.
- EDDY, WALTER H. The vitamin manual. Baltimore, Williams, 1921. 121 p. Bibl., p. 94-121. 500 references.
- EDDY, WALTER H. The vitamins. *Abstracts Bact.* 3: 313-330 (1919). 236 references.
- ELLIS, CARLETON, and MACLEOD, A. L. Vital factors of foods: vitamins and nutrition. New York, Van Nostrand, 1922. 391 p. Bibl. footnotes.

- FUNK, CASIMIR. Studies on vitamins and deficiency diseases during the years 1913-1915. *Biochem. Bull.* 4: 354-364 (1915). 170 references.
- FUNK, CASIMIR. The vitamins. Baltimore, Williams, 1922. 502 p. Bibl., p. 395-475. 1595 references.
- FUNK, CASIMIR. Ueber die physiologische Bedeutung gewisser bisher unbekannter Nahrungsbestandteile, die Vitamine. *Ergeb. Physiol.* 13: 126-205 (1913). 273 references.
- GT. BRIT. Medical research committee. Report on the present state of knowledge concerning accessory food factors. 2nd ed. London, 1924. 171 p. Bibl., p. 152-161.
- HARROW, BENJAMIN. Vitamins: essential food factors. New York, Dutton, 1922. 261 p. Bibl., p. 204-213. Rev. of recent literature, p. 231-254.
- MACALLUM, A. B. The relation of vitamins to the growth of young animals. *Trans. Royal Can. Inst.* 12: 238-240 (1920). 150 references.
- ROHMANN, F. Ueber künstliche Ernährung und Vitamine. Berlin, Borntraeger, 1916. 150 p. 159 footnotes.
- SCHAEFFER, G. Vitamines; auximones, 1914-1918. *Bull. soc. sci. hyg.* 6: 369-374 (1918); *Bull. inst. Pasteur* 17: 58-59 (1919).
- SHERMAN, H. C. The vitamins. *Physiol. Rev.* 1: 619-630 (1921). Selected bibl. of 230 references.
- SHERMAN, H. C., and SMITH, S. L. The vitamins. New York, Chem. Cat. Co., 1922. 273 p. Bibl., p. 235-260. About 1000 references.
- SJOLLEMA, B. Ergebnisse und Probleme der modernen Ernährungslehre. *Ergeb. Physiol.* 20: 207-405 (1922). Bibl. footnotes.
- STEPP, WILHELM. Ueber Vitamine und Vitaminosen. *Ergeb. inneren Medizin* 23: 67-72 (1923). 139 references.
- VANDEVELDE, J. J. Bibliographie des vitamines. *Bull. inst. fermentation de Gand* 29: 239-260 (1920).
- See also* FOODS (Soc. Chem. Ind.); METABOLISM; NUTRITION.

VOLCANOLOGY

- ALLEN, E. T. Chemical aspects of volcanism with a collection of the analyses of volcanic gases. *J. Franklin Inst.* 193: 29-80 (1922). 60 footnotes.

VOLTMETER

- ROSA, E. B., and VINAL, G. W. Bibliography of the silver voltameter with a few papers on closely allied subjects. *Bull. U. S. Bur. Stand.*,

VOLTMETER—Cont'd

13: 507-512 (1916-1917). About 200 references. Cf. Bull. 9: 151-170 (1913). 60 footnotes.

VULCANIZATION

BEDFORD, C. W. The chemistry of rubber vulcanization and acceleration. *J. Ind. Eng. Chem.* 14: 856-857 (1922). 24 references.

BERNSTEIN, GUSTAV. Beitrag zur Kenntniss der Kaltvulkanisation des Kautschuks. *Kunststoffe* 2: 287-292 (1912). 22 footnotes.

EATON, B. J. Preparation and vulcanization of plantation Para rubber. *Bull. Agr. Dept., Federated Malay States*, No. 27, 1918. *Bibl.*, p. 395-398. 57 references.

FARBER, EDUARD. Ueber die Vulkanisation des Kautschuks. *Chem.-Ztg.* 47: 595-597 (1923). 22 footnotes.

HALEN, S. Patente betreffend der Beschleunigung der Vulkanisation von natürlichen oder künstlichen Kautschukarten. *Kunststoffe* 12: 147-149 (1922). 30 patents.

HALEN, S. Neuere Vulkanisationsverfahren. *Kunststoffe* 14: 98-101, 136-137 (1924). Patents.

KAUSCH, OSKAR. Tabellarische Uebersicht ueber die aus der Patentliteratur bekannter Verfahren und Vorrichtungen zum Vulkanisieren des Kautschuks, der Guttapercha oder dgl. *Kunststoffe* 2: 363-368, 386-388 (1912). Patents.

KRAATZ, G. D., FLOWER, A. H., and COOLIDGE, C. The action of certain organic accelerators in the vulcanization of rubber. *J. Ind. Eng. Chem.* 12: 317-324 (1920). *Bibl.* footnotes.

LOEWEN, HEINRICH. Zur Theorie der Vulkanisation des Kautschuks. *Z. angew. Chem.* 25: 1553-1560 (1912). 46 footnotes.

OSTWALD, WOLFGANG. Beiträge zur Kolloidchemie des Kautschuks. I. Zur Theorie den Vulkanisation. *Kolloid-Z.* 6: 136-155 (1910). 66 footnotes.

SHEPARD, N. A., and KRALL, S. Studies in rubber vulcanization. *J. Ind. Eng. Chem.* 14: 951-956 (1922). 25 references.

SPENCE, D., and YOUNG, J. Beiträge zur Chemie des Kautschuks. Zur Theorie der Vulkanisation. *Kolloid-Z.* 11: 28-34, 274-280 (1912); 13: 265-271 (1913). About 50 footnotes.

TWISS, D. F. The chemistry of vulcanisation. *J. Soc. Chem. Ind.* 36: 788-789 (1917). 85 references.

WILHELM, G. Ueber Vulkanisationsbeschleuniger. *Kunststoffe* 10: 217-218 (1920). Patents.

See also RUBBER.

VULCANIZED FIBER

HALLE, --. Ueber Vulkanfaser. *Kunststoffe* 7: 1-4, 19-21, 32-34 (1917). Patents through text.

WASTE

ESTEN, P. A. Bibliography of tannery waste treatment. *J. Am. Leather Chem. Assoc.* 6: 464-466 (1911); *J. Soc. Chem. Ind.* 30: 1270-1271 (1911). 26 references, covering 1895-1911.

GREENMAN, E. D. Selective bibliography on waste utilization as affected by the war. *J. Ind. Eng. Chem.* 11: 1171-1172 (1919). 65 references.

HOMMON, HARRY B. Bibliography of tannery waste treatment. *U. S. Public Health Bull.* No. 100, p. 130-133 (1919). Chronological, 1865-1917. 75 references.

HOMMON, HARRY B. The purification of creamery wastes. *U. S. Public Health Bull.* No. 109, p. 56-58 (1920). 63 references.

JACKSON, D. D., and BUSWELL, A. M. Disinfection of tannery wastes. *J. Am. Leather Chem. Assoc.* 12: 229-253 (1917). 21 references, p. 253.

THIESING, --. Aus der Literatur ueber die Müllbeseitigung in und nach dem Kriege. *Zentr. ges. Hyg.* 2: 182-188 (1922). 200 references.

See also GARBAGE, SANITATION, SEWAGE.

WATER

BLACHER, C. Neues aus der Chemie des Wassers. *Chem.-Ztg.* 35: 353-354, 370-372, 390-392, 398-399 (1911). 237 footnotes.

BOURGOIN, E. A. Eau. In Frémy, *Enc. chim.* 4: 171-304 (1882).

GOLDBERG, A. Ueber die Fortschritte auf dem Gebiete der Chemie des Wassers, sowie der natürlichen und künstlichen Mineralwasser. *Chem.-Ztg.* 26: 912-918 (1902); 247 footnotes. 27: 869-874 (1903); 174 footnotes. 28: 908-912 (1904); 188 footnotes. 29: 915-921 (1905); 237 footnotes. 32: 173-175, 187-189, 203-205 (1908); 273 footnotes.

KREMAN, R. Wasser. In Doelter, *Handb. Mineralchem.* 3, pt. 1: 855-915 (1918). *Bibl.* footnotes.

MELLOR, J. W. Water. In *his* *Inorg. theor. Chem.* 1: 405-505 (1922). Purification, 20 references; volume changes, 200 references; vapor pressure, 250 references; allotropic forms, 100 references; physical properties, 400 references; chemical

- properties, 300 references; *see also* p. 135, decomposition by metals, 30 references; p. 138, decomposition by electricity, 30 references; p. 145, synthetic, Cavendish's experiments, 50 references.
- MENZIES, A. W. C. Molecular state of water vapor. *J. Am. Chem. Soc.* 43: 851-857 (1921). 30 references.
- "Potable waters." *Ind.-Cat. S. G. O.*, 2nd ser., 20: 450-452 (1915).
- PRANDTL, W. Wasser. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 1, pt. 1: 94-124 (1907). References through text.
- SABATIER, P. Eau (Protoxyde d'hydrogène). *In* Moissan, *Chim. min.* 1: 237-261 (1904). 250 footnotes.
- VANDEVELDE, A. J. J. [Investigations on water (during 1906).] *Bull. Serv. Surveill. Fabric. Com. Dendrées Aliment.*, 1907, p. 8-16.
- "Water." *Ind.-Cat. S. G. O.*, 1st ser., 16: 65-143 (1895); 2nd ser., 20: 431-504 (1915).
- Serial*
- Journal of the American Water Works Association. 1922-. Abstracts are not classified.
- Wasser und Abwasser. *Sammelblatt für Wasserversorgung und Beseitigung flüssiger und fester Abfallstoffe.* 1909-. Abstracts are not classified.
- WATER: Analytical.**
- AMERICAN PUBLIC HEALTH ASSOCIATION. Laboratory section. Standard methods for the examination of water and sewage. 5th ed. New York, Am. Public Health Assoc., 1923. 111 p. Contains bibls.
- "Analysis of water." *Ind.-Cat. S. G. O.*, 1st ser., 16: 71-77 (1895); 2nd ser., 20: 432-435 (1915).
- CLARKE, F. W. Water analysis. *In* his *Data of geochemistry*, 4th ed., p. 210-212. 50 entries. (*U. S. Geol. Sur.*, *Bull.* No. 695).
- EMMERLING, O. Praktikum der chemischen, biologischen und bakteriologischen Wasseruntersuchungen. Berlin, Borntraeger, 1914. *Bibl.*, p. 191-196.
- LEVINE, MAX. Bacteria fermenting lactose and their significance in water analysis. *Iowa State Coll. Agr. Mech. Arts*, 20, No. 31 (*Eng. Expt. Sta.*, *Bull.* 62), 1921. 127 p. *Bibl.*, p. 119-127.
- PLÜCKER, W. Nachweis und Beurteilung des *Bacterium coli* in Trinkwasser. *Z. Nahr.-Genussm.* 27: 538-543 (1919). 135 references.
- RAFTER, GEORGE W. The microscopical examination of potable waters. New York, Van Nostrand, 1892. 160 p. *Bibl.*, p. 137-160.
- REDFIELD, HARRY W. A study of hydrogen sulfide production by bacteria and its significance in the sanitary examination of water. Thesis, Cornell Univ., 1912. 110 p. *Bibl.*, p. 107-110.
- SAVAGE, W. G. The bacterial examination of water supplies. London, Lewis, 1906. 297 p. 239 references.
- TURNEAURE, F. E., and RUSSELL, H. L. Public water supplies. New York, Wiley, 1916. 808 p. Contains bibls.
- WHIPPLE, GEORGE C. The microscopy of drinking water. 3rd ed. New York, Wiley, 1914. 409 p. *Bibl.*, p. 393-400.
- See also* FOOD (Tanner).
- WATER: Mineral.**
- CHRISTY, ROBERT M. A history of the mineral waters and medicinal springs of the county of Essex. Essex field club, Special mem., vol. 4, 1910. 73 p. *Bibl.*, p. 6-10. Chronological.
- DOLE, R. B. Published analyses of American mineral waters. *U. S. Geol. Sur.*, *Mineral Resources*, 1913, pt. 2: 433-434 (1914). 22 references.
- ELLIS, A. J. Mineral waters. *U. S. Geol. Sur.*, *Mineral Resources*, 1916, pt. 2: 509-510. 26 references, covering 1888-1913.
- GARNAUD, PAUL-JEAN. Étude des sédiments et dépôts des eaux minérales de la Limagne d'Auvergne. Thesis, Paris, 1911. 82 p. *Bibl.*, p. 77-80.
- KIRBY, WM. The evolution of artificial mineral waters. Manchester, Eng., Jewsbury, 1902. 155 p. *Bibl.*, p. 133-140.
- KREMAN, R. Mineralwasser. *In* Doelter, *Handb. Mineralchem.* 3, pt. 1: 893-907 (1918). *Bibl.* footnotes.
- LOPEZ, ALFREDO L. Aguas minero medicinaes de Portugal. Lisbon, 1892. 477 p. *Bibl.* of waters with chemical analyses.
- MITCHELL, C. A. Mineral and aerated waters. New York, Van Nostrand, 1913. 227 p. *Bibl.*, p. 217-220.
- [Nature of springs and their classification.] *Ing. Amerigo Raddi il Politecnico*, 1916: 545-568. Italian works.
- PEALE, A. C. Bibliography of mineral waters. *U. S. Geol. Sur.*, *Mineral Resources* 1905: 1308-1312. 104 references.
- "Waters, mineral." *Ind.-Cat. S. G. O.*, 1st ser., 16: 151-314 (1895); 2nd ser., 20: 506-595 (1915).

WATER: Physiological.

HAWK, PHILIP B. Water as a dietary constituent. *In* Barker, *Endocrinology and metabolism*, 3: 275-294; references, 5: 345-509 (1922).

HIBBARD, R. P. The question of the toxicity of distilled water. *Am. J. Bot.* 2: 389-401 (1915). 20 footnotes.

ROWNTREE, LEONARD G. The water balance of the body. *Physiol. Rev.* 2: 161-169 (1922).

SCHADE, H. Wasserstoffwechsel. *In* Oppenheimer, *Handb. Biochem.* 2nd ed., 8: 149-182 (1924). 123 footnotes.

TRUE, RODNEY H. The harmful action of distilled water. *Am. J. Bot.* 1: 255-274 (1914). 39 references.

WATER: Purification and supply.

ALVORD, JOHN W. Recent progress and tendencies in municipal water supply in the United States. *Trans. Intern. Eng. Congr., Paper No. 53*, 1915. *Bibl.*, p. 199-204. 88 references.

BOOTH, WM. M. Distilled water. *Trans. Am. Inst. Chem. Eng.* 10: 276-285 (1917). Largely patents on apparatus.

BUSWELL, A. M., and EDWARDS, G. P. Some facts about residual alum in filtered water. *Chem. Met. Eng.* 26: 826-829 (1922). 25 references.

CARNEGIE LIBRARY, Pittsburgh. Water softening. *In its Mo. Bull.* June, 1904, p. 165.

DON, JOHN, and CHISHOLM, JOHN. Modern methods of water purification. 2nd ed. London, Longmans, 1913. 398 p. *Bibl.*, p. 386-389.

FALES, ALMON L. Industrial wastes in relation to water supply. *J. Am. Water Works Assoc.* 10: 415-430 (1923). 35 references.

HINMAN, JACK J. A bibliography of field water supply. *Am. J. Public Health* 8: 670-673 (1918). 159 references.

NEW YORK PUBLIC LIBRARY. Check list of works relating to the water supply, sewers, etc., of the City of New York in the New York public library. *Bull. N. Y. Public Library* 5: 133-140 (1901). Covers 1799 to 1900.

RACE, JOSEPH. Chlorination of water. New York, Wiley, 1918. 158 p. *Bibl.* at end of chapters.

RIDEAL, SAMUEL, and RIDEAL, ERIC K. Water supplies; their purification, filtration and sterilization. London, Lockwood, 1914. 274 p. *Bibl.* at end of chapters.

SCHWAB, JAMES W. The removal of iron from municipal water supplies.

Univ. Kansas, *Bull.* 17, No. 8 (Eng. *Bull.* No. 7), 1916. 41 p. *Bibl.*, p. 38-41. 109 references.

SMITH, OTTO M. Silicic acid, its influence and removal in water purification. *Ill. State Water Sur., No. 16*, 1920. *Bibl.*, p. 180-181. 53 references.

SOCIETY OF CHEMICAL INDUSTRY. Water purification and sanitation. *In* Annual reports of applied chemistry, 1: 260-270 (1916); 2: 449-467 (1917); 3: 417-429 (1918); 4: 465-488 (1919); 5: 471-485 (1920); 6: 498-516¹ (1921); 7: 460-487 (1922); 8: 515-517 (1923); 9: 533-550 (1924). *Bibl.* footnotes.

STABLER, H., and CHAMBERS, A. A. Water for industrial use. *In* Rogers, *Manual of Industrial Chemistry*, 3rd ed., p. 98-101.

"Water, filtration of." *Ind.-Cat. S. G. O.*, 2nd ser., 20: 445-447 (1915).

"Water, purification of." *Ind.-Cat. S. G. O.*, 1st ser., 16: 81-95 (1895); 2nd ser., 20: 452-460 (1915).

WOLMAN, ABEL, and HANNAN, FRANK. Residual aluminium compounds in water filter effluents. *Chem. Met. Eng.* 24: 735 (1921). 26 references.

See also PERMUTIT, ZEOLITES.

WATER: Radioactivity.

LUCAS, RICHARD. Radioaktivität natürlicher Wässer. *In* Gmelin-Kraut, *Handb. anorg. Chem.* 3, pt. 2: 48-50 (1908).

SATTERLY, JOHN, and ELWORTHY, R. T. The radioactivity of some Canadian mineral springs. Canada, Dept. Mines, *Mines Br., Bull.* No. 16, 1917. 60 p. *Bibl.*, p. 53-54. 29 references.

SCHOLL, CLARENCE. Radioactivity of Illinois waters. *Univ. Illinois, Bull.* 15, No. 11: 137-139 (1917). 127 references.

WATER: Sterilization.

SCHROETER, —. Trinkwasser-Sterilisation mittels ultravioletter Strahlen. *Z. Hyg. Infektionskrank.* 72: 189-212 (1912). 42 references.

SILBERMANN, A. Sterilisation von Wasser durch ultraviolette Strahlen. *Z. Hyg. Infektionskrank.* 77: 189-216 (1914). 39 references.

WATER: Underground.

DOLE, R. B. Use of fluorescein in the study of underground waters. *U. S. Geol. Sur., Water Supply Paper* No. 160, 1906. *Bibl.*, p. 83-85. 69 references.

FULLER, MYRON L. Bibliographic review and index of papers relating to underground waters published by the U. S. Geological Survey, 1879-1904. *U. S. Geol. Sur., Water Sup-*

- ply Paper No. 120, 1905. 128 p. 628 references, annotated. Arranged by author with subject index.
- FULLER, M. L., CLAPP, F. G., and JOHNSON, B. L. Bibliographic review and index of underground water literature published in 1905. U. S. Geol. Sur., Water Supply Paper No. 163. 130 p. 721 references.
- FULLER, M. L. Hydrologic work in eastern United States and publications on ground waters. U. S. Geol. Sur., Water Supply Paper No. 145, 1905. Bibl., p. 24-29. 76 references.
- FULLER, M. L. Work of the Eastern section of hydrology in 1905 and publications relating to underground waters. U. S. Geol. Sur., Water Supply Paper No. 160, 1906. 128 references.
- MEINZER, OSCAR E. Bibliography and index of the publications of the U. S. Geological Survey relating to ground water. U. S. Geol. Sur., Water Supply Paper No. 427, 1918. 169 p. 454 references.
- MEINZER, OSCAR E. The occurrence of ground water in the United States with a discussion of principles. U. S. Geol. Sur., Water Supply Paper No. 489, 1923. 321 p. Bibl. footnotes.
- WATER GLASS.** See SODIUM SILICATE.
- WATERMARKS.** See PAPER, HAND-MADE.
- WATERPROOFING**
- PEARSON, HERBERT P. Waterproofing textile fabrics. New York, Chem. Cat. Co., 1924. Patent index, p. 65-97.
- ROSS, JOSEPH. Waterproofing engineering for engineers, architects, builders, roofers and waterprooferers. New York, Wiley, 1919. 442 p. Bibl., p. 423-427.
- WORDEN, E. C. Nitrocellulose waterproofing composition. *In his* Technology of cellulose esters 1: 2610-2615 (1921). Bibl. footnotes.
- WAXES**
- FISCHER, E. J. Technische Wachspräparate. *Kunststoffe* 9: 105-109 (1919). Patents.
- See also FATS, OILS, WAXES.
- WEATHERING.** See ROCKS.
- WEIGHTS AND MEASURES.** See METRIC SYSTEM.
- WETTING POWER.** See SURFACE TENSION.
- WHEAT**
- CHOATE, HELEN A. Chemical changes in wheat during germination. *Bot. Gaz.* 71: 424-425 (1921).
- DONDLINGER, P. T. The book of wheat. New York, Orange Judd, 1908. 369 p. Bibl., p. 326-358.
- OLSON, GEO. A. Wheat and flour investigations. Wash. Agr. Expt. Sta., Bull. No. 144, 1917. 86 p. Bibl., p. 81-86.
- OLSON, GEO. A. Study of factors influencing the nitrogen content of wheat and of the changes that occur during the development of wheat. *J. Agr. Res.* 24: 951-953 (1923). 41 references.
- See also FLOUR.
- WINE**
- COCKS, CHARLES. Bordeaux et ses vins, classés par ordre de mérite. Bordeaux, Feret, 1908. 1118 p. Bibl., p. 1112-1118.
- LABORDE, J. Cours d'oenologie. Paris, Mulo, 1907. Bibl., p. 331-336.
- ROETTGEN, THEODOR. Bestimmung der Milchsäure im Weine nach dem Verfahren von Möslinger und Kunz. *Z. Nahr.- Genussm.* 24: 113-124 (1912). Bibl. footnotes.
- SIMON, A. L. Bibliotheca vinaria; a bibliography of books and pamphlets dealing with viticulture, wine making, distillation, etc. London, Richards, 1913. 339 p.
- "Wines." *Ind.-Cat. S. G. O.*, 1st ser., 16: 490-499 (1895); 2nd ser., 21: 153-160 (1916).
- WINE: Analytical.**
- BARAGIOLA, W. J., and GODET, CH. Die Bestimmung des Ammoniums im Weine und ihre Bedeutung. *Z. Nahr.- Genussm.* 30: 169-216 (1915). About 100 footnotes.
- BARAGIOLA, W. J., and GODET, CH. Weine mit schwach alkalischen Aschen. *Z. Nahr.- Genussm.* 30: 67-100 (1915). 72 footnotes.
- WITHERITE.** See BARIUM CARBONATE.
- WOOD**
- BEAUVIERE, J. Les bois industriels. Paris, Doin, 1910. 420 p. Bibl., p. 387-395.
- RECORD, SAMUEL J. The mechanical properties of wood, including a discussion of the factors affecting the mechanical properties and methods of timber testing. New York, Wiley, 1914. 165 p. Bibl., p. 147-160.
- RECORD, SAMUEL J. Bibliography of the woods of the world (exclusive of the temperate region of North America) with emphasis on tropical woods. New Haven, 1923. 40 p., mimeographed. 644 titles.
- STONE, HERBERT. A textbook of wood. London, Rider, 1921. 240 p. Bibl., p. 224-233.
- STONE, HERBERT. The timbers of commerce and their identification. London, Rider, 1914. 311 p. Bibl., p. 285-290.

WOOD—Cont'd

WAESER, BRUNO. Die Chemie des Waldes. Z. angew. Chem. 33: 85-89 (1920). 115 footnotes.

See also FIBERS (Soc. Chem. Ind.).

WOOD DISTILLATION

BATES, JOHN S. Distillation of hardwoods in Canada. Canada, Dept. Interior, Forestry Br., Bull. No. 74, 1922. 41 p. Bibl., p. 38-39.

BOAS, ISAAC H. Wood waste. Australia, Inst. Sci. Ind., Bull. No. 19, 1921. 82 p. Bibl., p. 81-82. 38 references.

FRAPS, G. S. Composition of a wood oil. Am. Chem. J. 25: 26-53 (1901). 30 footnotes.

KLAR, M. Verzeichnis der Patente ueber Holzverkohlung, Essigsäure, Aceton, Holzgeist (Methylalkohol) und Kienöl (Terpentinol). In *his* Technologie der Holzverkohlung, 2nd ed., 1920, p. 403-419. About 300 patents, arranged by countries and covering 1877-1908.

See also CHARCOAL.

WOOD PRESERVATION

AMERICAN WOOD PRESERVERS' ASSOCIATION. Handbook on wood preservation. Baltimore, 1916. 73 p. Bibl., p. 56-73. 450 references.

ATWOOD, WM. G., and JOHNSON, A. A. Wood preservation. In *their* Marine structures, 1924, p. 474-496.

BEROLZHEIMER, D. D. United States patents on wood preservation. Proc. Am. Wood Preservers' Assoc. 1916: 403-408.

BUB-BODMAR, F., and TILGER, B. Die Konservierung des Holzes in Theorie und Praxis. Ein Handbuch für Alle, die mit der Lieferung, dem Brauche, der Dauererhöhung und Tränkung von Holz zu tun haben, sowie für maschinen- und chemische Fabriken. Berlin, Parey, 1922. 1006 p. Bibl. at end of chapters.

FOREST PRODUCTS LABORATORY. List of publications on wood preservation. Madison, 1921. 25 p.

HALEN, S. Die Verfahren zur Behandlung des Holzes mit Chemikalien zum Zwecke gegen die verschiedensten Einflüsse beständige Produkte zu erzeugen. Kunststoffe 2: 424-428, 449-454, 461-466 (1912); 9: 45-48 (1919). Patents largely.

HOGUE, C. J., et al. Report of Committee on properties of treated woods. I. Mechanical properties of treated woods. Proc. Am. Wood Preservers' Assoc., 1923: 359-379.

HORNOR, R. R. Bibliography of articles relating to the preservation of mine timbers. 1883-1921. U. S. Bur.

Mines, Repts. of Investigations, No. 2343, 1922. 6 p., mimeographed.

HUMPHREY, C. J., and FLEMING, RUTH M. Toxicity to fungi of various oils and salts, particularly those used in wood preservation. U. S. Dept. Agr., Bull. No. 227, 1915. 38 p. Bibl., p. 37-38. 34 references.

MARSCHALK, J. Verfahren zur Behandlung des Holzes mit Chemikalien um gegen die verschiedenen Einflüsse beständige Produkte zu erhalten. Kunststoffe 7: 60-62, 77-80 (1917). 82 patents.

MOLL, FRIEDRICH. Die Entwicklung und der gegenwärtige Stand der Holzimprägnierung mit Salzen. Z. angew. Chem. 28: 317-322, 328-331 (1915). 185 patent references.

MOLL, F. Ueber die Verwendung ammoniakalischer Salzlösungen zur Holzkonservierung. Z. angew. Chem. 29: 339-341 (1916). 94 patents.

MOLL, F. Physikalische und chemische Eigenschaften der zur Holzkonservierung angewandten Teere und Teerderivate. Z. angew. Chem. 26: 792-800 (1913). 48 footnotes.

TEESDALE, CLYDE H., and MACLEAN, J. D. Relative resistance of various hardwoods to injection with creosote. U. S. Dept. Agr., Bull. No. 606, 1918. 36 p. Bibl. of departmental publications, p. 34-36.

TROSCHEL, ERNST. Handbuch der Holzkonservierung. Berlin, Springer, 1916. 540 p. Bibl. of patents, collected by F. Moll, p. 498-540.

WEISS, H. F. United States patents on wood preservation, 1880-1916. Proc. Am. Wood Preservers' Assoc., 1915: 482-500. In Weiss, Preservation of structural timbers, 2nd ed., 1920.

WOOD PULP. See PAPER.

WOOD SUBSTITUTES

FISCHER, E. J. Holzersatzmassen. Kunststoffe 7: 233-235, 244-248 (1917). Patents, arranged by countries.

KAUSCH, OSKAR. Verfahren zur Herstellung von Kunstholz oder Holzersatzmassen. Kunststoffe 3: 349-351 (1913). Patents.

WOOL

MEYER, H. H. B. Select list of references on wool with special reference to the tariff. Washington, Library of Congress, 1911. 163 p. Wool manufacture, p. 65-80.

See also COTTON (Ward), FIBERS.

XANTHENE

MEYER-JACOBSON. Xanthen-Körper. In *their* Lehrb. org. Chem. 2, pt. 3: 753-769 (1917). Bibl. footnotes.

XANTHINE

BRAHM, CARL, and SCHMIDT, J. Xanthin. In *Abderhalden, Biochem. Handl.* 4: 1040-1044 (1911). Bibl. footnotes.

GOLOWINSKI, J. W. Beiträge zur Wirkung der Xanthinderivate. *Arch. ges. Physiol.* 160: 205-323 (1914-1915). Bibl. footnotes.

MEYER-JACOBSON. Xanthin. In *their Lehrb. org. Chem.* 2, pt. 3: 1272-1284 (1920). Bibl. footnotes.

"Xanthine." *Ind.-Cat. S. G. O.*, 1st ser., 16: 721 (1895); 2nd ser., 21: 366 (1916).

See also PURINES.

XENON

BRISCOE, H. V. Xenon. In *Friend, Textbook* 1, pt. 2: 351-354 (1914). Bibl. footnotes.

See also AIR, ATMOSPHERE, RARE GASES.

XEROFORM

"Xeroform (Tribromophenol bis-muth)." *Ind.-Cat. S. G. O.*, 2nd ser., 21: 372 (1916).

XYLAN

GRAFE, VIKTOR. Xylan. *Holzgummi. In Abderhalden, Biochem. Handl.* 2: 28-33 (1911); 8: 3-5 (1914). About 100 footnotes.

See also GUMS.

XYLENE

BAUM, FRITZ. *o*-, *m*-, and *p*-Xylol. In *Abderhalden, Biochem. Handl.* 1: 254-280 (1911). Bibl. footnotes.

See also HYDROCARBONS.

XYLOSE

FRED, E. B., PETERSON, W. H., and DAVENPORT, A. Acid fermentation of xylose. *J. Biol. Chem.* 39: 347 (1919). 50 references.

HARDING, T. SWANN. History of xylose, its discovery and methods of preparation. *Sugar* 25: 125 (1923). 23 references.

NEUBERG, C., and REWALD, B. *l*-Xylose. In *Abderhalden, Biochem. Handl.* 2: 292-299 (1911); 8: 114-115 (1914). About 120 footnotes.

ZEMPLÉN, GÉZA. Xylose. In *Abderhalden, Biochem. Handl.* 10: 382-386 (1923). Bibl. footnotes.

ZEMPLÉN, GÉZA. Xylose. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 5: 923-925 (1922). Bibl. footnotes.

See also CARBOHYDRATES.

YEAST

BIRCKNER, VICTOR. New glycolytic ferment of yeast. *J. Am. Chem. Soc.* 34: 1213-1229 (1912). Bibl. footnotes.

GUILLIERMOND, ALEXANDRE. Les levures. Paris, Doin, 1912. 565 p. Bibl., p. 513-538. Translation by

Tanner, New York, Wiley, 1920. 424 p. Bibl., p. 381-409.

KIRBY, WILHELM. Handbuch der Presshefenfabrikation. Braunschweig, Vieweg, 1912. 669 p. Bibl., p. 644-649.

PARIS, G. Il succo di levito. *Ann. chim. appl.* 7: 210-299 (1917). Bibl. footnotes.

SWOBODA, F. K. Nitrogen metabolism of yeast. *J. Biol. Chem.* 52: 91-109 (1922). 31 references.

"Yeast." *Ind.-Cat. S. G. O.*, 1st ser., 16: 732 (1895); 2nd ser., 21: 378-384 (1916).

See also ENZYMES; FERMENTATION; FOOD (Tanner).

YOGHURT

"Yoghurt." *Ind.-Cat. S. G. O.*, 2nd ser., 21: 387-388 (1916).

See also MILK, FERMENTED.

YOHIMBINE

"Yohimbin." *Ind.-Cat. S. G. O.*, 2nd ser., 21: 388-389 (1916).

YTTERBIUM. See RARE EARTHS.**YTTRIUM**

CLEVE, P. T. L'yttrium et ses composés. In *Frémy, Enc. chim.* 3; 5^e cahier: 174-175 (1884).

DENNIS, L. M., and DALES, B. Chemistry of the rare earths of the yttrium group. *J. Am. Chem. Soc.* 24: 401-435 (1902). 120 footnotes.

MELLOR, J. W. Yttrium. In *his Inorg. theor. Chem.* 5: 684-685 (1924).

URBAIN, G. Twenty-five years of research on the yttrium earths. *Chem. Rev.* 1: 184-185 (1924). 53 references to his own work.

See also RARE EARTHS.

ZEOLITES

RINNE, F. Kristallographisch-chemischer Ab- und Umbau insbesondere von Zeoliten. *Fortschr. Mineral. Krist. Petr.* 3: 181-183 (1913). 55 references.

STOKLOSSA, GEORG. Ueber die Natur des Wassers in den Zeoliten. *Neues Jahrb. Mineral. Geol.* 42: 1-64 (1918-1919). References to analyses through text.

ZINC

COHEN, ERNST, and HELDERMAN, W. D. Physikalisch-chemische Studien an Zink. *L. Z. physik. Chem.* 87: 426 (1914). 12 footnotes on allotropy of zinc.

DRUCKER, K. Zinc. In *Abegg, Handb. anorg. Chem.* 2, pt. 2: 408-426 (1905). 780 references.

GIRAN, H. Zinc. In *Moissan, Chim. min.* 3: 986-1056 (1904). 708 footnotes.

GT. BRIT. Imperial mineral resources bureau. Mineral industry of the

ZINC—Cont'd

British Empire and foreign countries. War period. Zinc (1913-1919). London, 1921. 112 p. Bibl., p. 91-104.

MELLOR, J. W. Zinc and cadmium. *In his Inorg. theor. chem.* 4: 398-694 (1923). Bibl. through chapter.

PETERS, F. Neuere Einrichtungen zur Destillation und Verdichtung des Zinks. *Glückauf* 53: 733, 749, 765, 777, 793 (1917). Bibl. footnotes.

RIGGS, GILBERT. Zinc dust precipitation tests. *Bull. Am. Inst. Mining Eng.* 1916, p. 513-514; *Mining Eng. World* 44, 122 (1916). Solubility of lead and cadmium in zinc.

ROTH, W. Zink. *In Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 1: 1-106, 485-776 (1911). References through text.

SABATIER, PAUL. Zinc. *In Frémy, Enc. chim.* 3, 6^e cahier: 1-226 (1885). References through text.

SIEBENTHAL, C. E. Zinc. *U. S. Geol. Sur., Mineral Resources*, 1907, pt. 1: 674-676; 57 references. 1915, pt. 1: 851-977; 147 references.

SMITH, ERNEST A. The zinc industry. London, Longmans, 1918. 223 p. Bibl., p. 217-221. 118 references.

"Zinc and its salts." *Ind.-Cat. S. G. O.*, 1st ser., 16: 782-785 (1895); 2nd ser., 21: 428-429 (1916).

ZINC: Alloys.

MELLOR, J. W. Alloys and intermetallic compounds of the calcium and zinc families. *In his Inorg. theor. chem.* 4: 689-694 (1923). About 750 references.

See also ALLOYS.

ZINC: Analytical.

NISSENSON, H. Die Untersuchungen des Zinks, mit besonderer Berücksichtigung der technisch wichtigen Zinkerze. Stuttgart, Enke, 1907. 140 p. Bibl. footnotes.

NISSENSON, H., and KETTEMBEIL, WILH. Ueber Zinkbestimmung. *Chem.-Ztg.* 29: 951-955 (1905). 82 footnotes.

PETERS, FRANZ. Die neuzeitliche Zinkanalyse. *Glückauf* 55: 101, 121, 137, 164, 183, 203 (1919). Bibl. footnotes.

ROTH, W. Erkennung und Bestimmung des Zinks. *In Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 1: 15-17, 575-578 (1911).

TAYLOR, FRANK O. Bibliography on methods of estimation of zinc, 1890-1911. *J. Ind. Eng. Chem.* 4: 468-469 (1912).

WILSON, L. A. Zinc dust analysis. *Proc. Am. Soc. Testing Materials*

21, pt. 2: 234 (1918); *Eng. Mining J.* 106: 145 (1918). 25 references.

ZINC: Electrodeposition.

MATHEWSON, EDWARD P. Electrodeposition of zinc from aqueous solutions. *Trans. Can. Mining Inst.* 20: 135-160 (1917); *Bull.* 59: 239-260 (1917). 250 references, 1880-1916.

See also ELECTROPLATING.

ZINC: Metallurgy.

GOJON and LEMARCHANDS. L'électrometallurgie du zinc. *Chimie & industrie* 8: 506-523 (1922).

HOFMAN, H. O. Metallurgy of zinc and cadmium. New York, McGraw, 1922. 341 p. Bibl. footnotes.

O'HARRA, B. M. A bibliography on the electrothermic metallurgy of zinc. *Univ. Missouri, School of mines and metallurgy, Tech. ser.*, 6, No. 2. 1922. 65 p. 662 references. A selected bibl. is given in *U. S. Bur. Mines, Bull.* No. 208, 1923, p. 93-103.

PETERS, F. Neuerungen in der Elektrometallurgie des Zinks und des Kadmiums. *Glückauf* 41: 1536, 1566 (1905); 45: 1401-1413 (1909); 51: 584, 605 (1915); 56: 61, 91, 107 (1920). Bibl. footnotes.

PETERS, F. Neues zur Gewinnung des Zinks auf nassem Wege. *Glückauf.* 54: 657, 673, 685, 705, 750, 767, 787 (1918). Bibl. footnotes.

PETERS, F. Die Zinkverhüttung auf trockenem Wege in den letzten Jahren. *Glückauf* 54: 153, 169, 192, 205, 229 (1918). Bibl. footnotes.

WHEELER, HAROLD L. A bibliography of the roasting, leaching, smelting and electrometallurgy of zinc. *Missouri School Mines, Bull., Tech. ser.*, 4, No. 3, 1918. 388 p. 2017 references and patents. Author and subject index.

ZINC: Plating. *See* ELECTROPLATING.**ZINC ALKYL COMPOUNDS**

MEYER-JACOBSON. Verbindungen des Zinks. *In their Lehrb. org. Chem.* 1, pt. 1: 463-466 (1907). Bibl. footnotes.

ZINC BROMIDE. *See* CADMIUM BROMIDE (Mellor).**ZINC CARBONATE**

LEITMEIER, H. Zinkcarbonat. *In Doelter, Handb. Mineralchem.* 1: 443-457 (1912). Bibl. footnotes.

See also CADMIUM CARBONATE (Mellor).

ZINC CHLORIDE

ROTH, W. Zinkchlorid. *In Gmelin-Kraut, Handb. anorg. Chem.* 4, pt. 1: 47-56, 643-665 (1911).

See also CADMIUM CHLORIDE (Mellor).

ZINC HYDROXIDE. *See* CADMIUM HYDROXIDE (Mellor).

ZINC IODIDE. *See* CADMIUM IODIDE (Mellor).

ZINC NITRATE. *See* CADMIUM NITRATE (Mellor).

ZINC OXIDES

ROTH, W. Zinkoxyd. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 18-23, 579-586 (1911).

See also CADMIUM OXIDE (Mellor).

ZINC PHOSPHATES. *See* CADMIUM PHOSPHATE (Mellor).

ZINC PHOSPHIDE

LIBERI, G. Sulla determinazione del fosforo nel fosfuro di zinco. *Ann. chim. appl.* 7: 144-151 (1917). 40 footnotes.

ZINC SILICATE

ENDELL, K. Zinksilicate. *In* Doelter, Handb. Mineralchem. 2, pt. 1: 780-792 (1914). Bibl. footnotes.

ZINC SULFATE

ROTH, W. Zinksulfat. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 35-43, 616-639 (1911).

See also CADMIUM SULFATE (Mellor).

ZINC SULFIDE

ROTH, W. Zinksulfid. *In* Gmelin-Kraut, Handb. anorg. Chem. 4, pt. 1: 29-34 (1911).

See also CADMIUM SULFIDE, LITHOPONE.

ZIRCONIA

FRANKLIN, A. J. Fused zirconia—the new refractory. *Metal Ind.* 14: 401-402 (1919). Bibl., largely from German sources.

ZIRCONIUM

ANDRIEUX, L. La zircone et le zirconium. *Industrie chimique* 8: 480-481 (1922). 21 references.

CAVEN, ROBERT M. Zirconium. *In* Friend, Textbook, 5: 260-276 (1917). Bibl. footnotes.

CLEVE, P. T. Le zirconium et ses composés. *In* Frémy, Enc. chim. 3, 5^e cahier: 52-53 (1884).

HALEN, S. Die neuesten Arbeiten und Erfindungen betreffend Zirkonium und seiner Verbindungen. *Edel-Erden u. -Erze* 2: 81-83 (1921). References through text. Covers period of 5 years.

HALEN, S. Die Verwendung des Zirkons und seiner Verbindungen. *Edel-Erden u. -Erze* 1: 121-124, 134-136, 149 (1920). References through text.

LANGMUIR, A. C., and BASKERVILLE, C. Index to the literature of zirconium, 1789-1899. *Smithsonian Misc. Coll.*, Pub. No. 1173, 1899. 29 p. 248 references, with author and subject index.

MARDEN, J. W., and RICH, M. N. Investigations of zirconium with special reference to the metal and oxide. Historical review and bibliography. *U. S. Bur. Mines, Bull.* No. 186, 1921. 146 p. Bibl., p. 119-144. 443 references; classified according to the mineral, salts, analytical, metal and alloys.

MEYER, R. J. Zirkonium. *In* Abegg, Handb. anorg. Chem. 3, pt. 2: 517-522 (1909). 169 references, 1789-1909.

SCHALLER, W. T. Thorium, zirconium and rare earth minerals. *U. S. Geol. Sur., Mineral Resources*, 1916, pt. 2: 386; 14 references. 1919, pt. 2: 31; 17 references.

STERRETT, D. B. Monazite and zircon. *U. S. Geol. Sur., Mineral Resources* 1911, pt. 2: 1196. 22 references.

VENABLE, FRANCIS P. Zirconium and its compounds. New York, Chem. Cat. Co., 1922. 173 p. Bibl., p. 133-169. 100 patents and 831 literature references.

VIGOUROUX, EM. Zirconium. *In* Moissan, *Chim. min.* 2: 530-559 (1905). 162 footnotes.

WEDEKIND, E. Studien ueber das elementare Zirkonium. *Ann.* 395: 149-194 (1913). Bibl. footnotes.

ZIRCONIUM: Analytical.

MARDEN, J. W. Analytical methods for zirconium. *U. S. Bur. Mines, Bull.* No. 212, p. 318-320 (1923). 32 references.

ZYMASE

ZUNZ, EDGARD. Zymase. *In* Abderhalden, *Biochem. Handl.* 5: 654-657 (1911). 65 footnotes.

"Zymase." *Ind.-Cat. S. G. O.*, 2nd ser., 21: 451 (1916).

See also ENZYMES.

PART V. PERSONAL BIBLIOGRAPHIES

A. GENERAL

- BOLTON, H. C. A select bibliography of chemistry, 1492-1892. 1st suppl., 1492-1897. 2nd suppl., 1492-1902. Section IV is devoted to biography, including bibliographies of individuals.
- MELLON INSTITUTE OF INDUSTRIAL RESEARCH. A list of the books, bulletins, journal contributions and patents by members of Mellon Institute of Industrial Research, 1911-1922. *In their Bibliographic Series* No. 1, 1922. 37 p.
- POGGENDORFF, J. C. Biographisch-Literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften enthaltend Nachweisungen über Lebensverhältnisse und Leistungen von Mathematikern, Astronomen, Physikern, Chemikern, Mineralogen, Geologen, Geographen, u. s. w. 4 vols. Vols. 1-2 cover up to 1858; vol. 3 covers from 1858-1883; vol. 4 covers from 1884-1900. Contains biographical data and list of important publications up to 1900 of practically every well-known chemist.
- WELLCOME CHEMICAL RESEARCH LABORATORIES, London. Titles of published papers from the Wellcome chemical research laboratories, 1897-1921. London, 1921. 21 p. 191 titles.

B. SPECIAL

- ABEGG, RICHARD. 1869-1910. Ber. 46: 627-628 (1913).
- ALSBERG, CARL L. 1877-. Biochem. Bull. 2: 214-216 (1913).
- ARRHENIUS, SVANTE. 1859-. Z. physik. Chem. 69: xxi-xxvii (1909). 104 titles.
- ARTH, GEORGES. 1853-1909. Bull. soc. chim. (4) 7: ix-x (1910). 33 titles.
- BAUBIGNY, HENRY. 1842-1913. Bull. soc. Chim. (4) 13, no. 16-17: xiii-xviii (1913). 90 titles.
- BAUER, ALEXANDER. Oesterr. Chem.-Ztg. 24: 99-104 (1921).
- BAUER, MAX. 1844-1917. Centr. Min. Geol. 1918: 73-84. 85 titles.
- BAUMANN, EUGEN. 1846-1896. Ber. 30: 3209-3213 (1897).
- BEILSTEIN, FRIEDRICH K. 1838-1906. Ber. 40: 5074-5078 (1907).
- BEMMELEN, JAKOB M. V. 1830-1910. *In his Die Absorption*, 1910, p. 6-12.
- BERTHELOT, MARCELIN. 1827-1907. Bull. soc. chim. (4) 13, no. 3: clvii-clcx (1913).
- BESREDKA, ALEXANDER. Biochim. therap. sper. 9: 344-351 (1922).
- BIGELOW, SAMUEL L. 1870-. *In Campbell, History of the Chem. Lab., Univ. of Mich., 1916, p. 29-33; in Univ. Mich. Bull. (n.s.) 21, no. 32: 8-9 (1920).*
- BODLANDER, GUIDO. 1855-1904. Ber. 39: 4287-4290 (1906). 68 titles.
- BOEKE, HENDRIK E. 1881-1918. Centr. Min. Geol. 1919: 90-96. 53 titles.
- BORSEAUDRAN, FRANÇOIS L. DE. 1838-1912. Rev. gen. chim. pure appl. 15: 369-372.
- BOUCHARDAT, GUSTAVE. 1842-1918. Bull. soc. chim. (4) 25: 538-541 (1919); Bull. soc. pharmacol. 26: 241-245 (1919). 61 titles.
- BOURQUELOT, EMILE. 1851-1921. Bull. soc. pharmacol. 28: 325-339 (1921); J. pharm. chim. 24: 447-464 (1921). Chronological, 1881-1921.
- BOUVEAULT, LOUIS. 1864-1909. Bull. soc. chim. (4) 7: xi-xxi (1910). 198 titles; chronological, 1889-1908.
- BROCHET, ANDRÉ. 1869-1923. Bull. soc. chim. (4) 35: 84-86 (1924). Chronological by journal.
- BRUHL, J. W. 1850-1911. Ber. 44: 3788-3794 (1911).
- CAMPBELL, EDWARD D. 1863-. *In his History of the Chem. Lab., Univ. of Mich., 1916, p. 35-43; in Univ. Mich. Bull. (n.s.) 21, no. 32: 13-14 (1920); 22, no. 43: 4 (1921); 24, no. 46: 8 (1923).*
- CANNIZZARO, STANISLAS. 1826-1910. Bull. soc. chim. (4) 7: vii-xiii (1911). 79 titles.
- CARO, HEINRICH. 1834-1910. Ber. 45: 1987-2042 (1912). Bibl. in form of footnotes.

- CHRISTENSEN, A. C. 1852-1923. *Arch. Pharm. Chem.* 31: 3-8 (1924).
- CLEVE, P. THEODOR. 1840-1905. *Ber.* 38: 4236-4238 (1905). 67 titles.
- COHEN, ERNST. 1869-1918. *Chem. Weekblad* 15:1452-1468 (1918). 225 titles.
- COMBES, ALPHONSE. 1858-1896. *Bull. soc. chim.* (3) 17: xix-xxii (1897).
- COPPET, LOUIS-CASINIR DE. 1841-1911. *Bull. soc. chim.* (4) 13, no. 7: vii-viii (1913). 25 titles.
- COTTRELL, FREDERICK G. 1877- . *J. Ind. Eng. Chem.* 11: 154 (1919); *Chem. Met. Eng.* 20: 114 (1919).
- CRAFTS, JAMES M. 1839-1917. *Nat. Acad. Sci. Biog. Mem.* 9: 169-177 (1919).
- CROSS, C. F. 1855- . *World's Paper Trade Rev.* 75: 338 (1921); *Paper Trade. J.* 73, no. 3: 46 (1921).
- DEMARCAEY, EUGENE. 1852- . *Bull. soc. chim.* (3) 31, no. 2: vi-viii (1904).
- DITTE, ALFRED. 1843-1908. *Bull. soc. chim.* (4) 5: xxii-xxx (1909).
- DIXON, HENRY H. *Sci. Proc. Royal Soc. Dublin* 15: 182-184 (1916). 61 titles.
- DOEBNER, OSKAR. 1850-1907. *Ber.* 40: 5138-5140 (1907).
- DOLZALEK, FRIEDRICK. 1873-1920. *Ber.* 54A: 24-25 (1921).
- DORP, WILLEM A. VAN. 1874-1914. *Rec. trav. chim.* 34: 387-390 (1915).
- DOSNE, ALBERT. *Bull. soc. ind. Mulhouse* 88: 417-429 (1922). Covers 1877-1920.
- DOSS, BRUNO. 1861-1919. *Centr. Min. Geol.* 1919: 257-268. 75 titles.
- DUDLEY, WM. L. 1859-1914. *J. Ind. Eng. Chem.* 6: 856 (1914). 30 footnotes.
- EDMUNDS, CHARLES W. 1873- . *In Univ. Mich. Bull.* (n. s.) 21, no. 32: 24-25 (1920); 22, no. 43: 9 (1921); 24, no. 46: 11 (1923).
- EGLSTON, THOMAS. 1832-1900. *School Mines Quart.* 21: 214-218 (1900).
- ERLENMEYER, EMIL. 1825-1909. *Ber.* 43: 3659-3664 (1910). Covers 1849-1897.
- ERLENMEYER, FRIEDRICH G. K. E. 1864-1921. *Ber.* 54A: 108-113 (1921).
- ESCALES, RICHARD. *Z. ges. Schiess-Sprengstoffw.* 19: 145-146 (1924).
- ETARD, ALEXANDRE. 1852-1910. *Bull. soc. chim.* (4) 9: xiv-xix (1911). Chronological, 1875-1910.
- EYKMAN, J. F. 1851-1915. *Rec. trav. chim.* 35: 410-420 (1915). 64 titles.
- FISCHER, EMIL. A complete bibl. will be found in his collected works, published under the following titles: *Untersuchungen über Kohlenhydrate und Fermente.* 2 vols. 1884-1908, 1908-1919. *Untersuchungen über Aminosäuren, Polypeptide und Proteine.* 2 vols. 1899-1906, 1907-1919. *Untersuchungen in der Puringruppe. Untersuchungen über Depside und Gerbstoffe.* 1908-1919. *Untersuchungen aus verschiedenen Gebieten; Vorträge und Abhandlungen allgemeinen Inhalts.*
- FITTIG, RUDOLPH. 1835-1910. *Ber.* 44: 1383-1401 (1911). 400 titles, covering 1858-1907.
- FLEISCHMANN, WILHELM. *Landw. Vers. Sta.* 97: 261-292 (1921). 190 titles.
- FRANCHIMONT, A. P. N. *Chem. Weekblad* 11: 382-391 (1914).
- FRANKLAND, EDWARD. 1825-1899. *Ber.* 33: 3871-3874 (1900). Covers 1847-1898.
- FREER, PAUL C. 1862-1912. *Philipp. J. Sci.* 7, Mem. No.: xxxviii-xli (1912); *Campbell, History of the Chem. Lab., Univ. of Mich.*, 1916, p. 58-64.
- FREUND, MARTIN. 1863-1920. *Ber.* 54A: 73-79 (1921). Covers 1884-1920.
- FRIEDEL, CHARLES. 1832-1898. *Bull. soc. chim.* (3) 24, no. 13: xlii-lvi (1900). 254 titles; chronological.
- FRIEDHEIM, CARL. 1858-1909. *Ber.* 44: 2804-2806 (1911). Covers 1882-1906.
- GATTERMANN, LUDWIG. 1860-1920. *Ber.* 54A: 115-141 (1921). Bibl. footnotes.
- GERNEZ, DESIRE J. B. 1834-1910. *Bull. soc. chim.* (4) 9: ii-viii (1911). 109 titles.
- GIBBS, JOSIAH WILLARD. 1839-1903. *Nat. Acad. Sci. Biog. Mem.* 6: 391-393 (1909).
- GIBBS, OLIVER WOLCOTT. 1822-1908. *Ber.* 42: 5051-5054 (1909); *Nat. Acad. Sci. Biog. Mem.* 7: 19-22 (1910); covers 1840-1894.
- GIRARD, AIMÉ. 1830-1898. *Bull. soc. chim.* (3) 19: xxiii-xxvi (1898).
- GOMBERG, MOSES. 1866- . *In Campbell, History of the Chem. Lab., Univ. of Mich.*, 1916, p. 65-73; *Univ. Mich. Bull.* (n. s.) 21, no. 32: 32-34 (1920); 22, no. 43: 11 (1922); 24, no. 46: 13 (1923).
- GRAMONT, A. DE. *Bull. soc. chim.* (4) 35: 76-80 (1924). Classified by journals.
- GREEN, WM. HOUSTON. 1853-1918. *J. Franklin Inst.* 186: 387-392 (1918).
- GRIMAU, EDOUARD. 1835-1910. *Bull. soc. chim.* (4) 9: xxiv-xxxvi (1911). 169 titles, covering 1863-1901.
- GUERIN, FELIX G. 1852-1917. *Bull. sci. pharmacol.* 24: 244-247 (1917). 72 titles.
- GUYE, PH. A. 1862- . *Helvetica Chim. Acta* 5: 422-431 (1922); *J. chim. phys.* 20: 10-17 (1923); *Anales soc. espan. fis. quim.* 20: 158-166 (1922). 209 titles.

- HADFIELD, ROBERT A. 1859-. *In his* Metallurgy of iron and steel, 1922, p. 106-116; *in* Burnham, Special steels, 1923, p. 166-185.
- HALE, WM. J. 1876-. *In* Campbell, History of the Chem. Lab., Univ. of Mich., 1916, p. 74-78.
- HAMBURGER, H. J. Chem. Weekblad 5: 414 (1908). 140 titles; chronological, 1882-1908.
- HARRISON, EDWARD F. 1869-1918. Pharm. J. 103:93-98 (1919).
- HARTWICK, C. 1851-1917. Schweiz. Apoth. Ztg. 55:148-155 (1917). Chronological.
- HAUTEFEUILLE, PAUL. 1836-1902. Bull. soc. chim. (3) 29:xvi-xx (1903). 102 titles.
- HAZEWINKEL, J. J. 1868-1917. Chem. Weekblad 14:267-272 (1917). 80 titles.
- HENRY, LOUIS. 1834-1913. Bull. soc. chim. (4) 15, no. 5:xx-xxxi (1914).
- HIDDEN, WM. EARL. 1853-1918. Am. Mineral. 4:144-145 (1919). 41 titles.
- HILL, HENRY BARKER. 1849-1903. Ber. 36:4579-4581 (1906); Nat. Acad. Sci. Biog. Mem. 5:264-266 (1905). 46 titles.
- HJELT, EDWARD I. 1855-1921. Ber. 55A:191-193 (1922). Covers 1877-1921.
- HÖFFER, HANS. Petroleum 20:419-426 (1924).
- HOFMEISTER, FRANZ. 1850-. *Ergeb. Physiol.* 22:39-50 (1923). 300 titles.
- HOLLEMAN, A. F. 1859-1918. Chem. Weekblad 15:1309-1325 (1918). 144 titles.
- HÖNIG, MAX. 1852-. *In* Margosches und Fuch, Über Naturprodukte, 1923, vi-viii. 53 titles.
- HOWE, HENRY M. 1848-1922. Bull. Am. Inst. Mining Eng., No. 127:xxxii (1917); Rev. metall. 19:574-578 (1922).
- HOWE, PAUL E. 1885-. *Biochem. Bull.* 2:202-203 (1913).
- HOWE, RAYMOND M. 1894-1924. Bull. Am. Ceram. Soc. 3:170-171 (1924). 30 titles.
- JAFFE, MAX. 1841-1911. Ber. 46:844-847 (1913). Covers 1862-1911.
- JOLY, ALEXANDER. 1845-1897. Bull. soc. chim. (3) 21:xii-xiv (1899).
- JONES, HARRY C. 1865-1916. J. Franklin Inst. 176:704-710 (1913). 84 titles. *See also his* Nature of solution, 1917, p. 359-370.
- JORDES, EDOUARD. 1868-1917. Kolloid-Z. 23:50-56 (1918). 80 titles.
- JORISSEN, WULLEM P. Chem. Weekblad 18:598-601 (1921).
- JUNGFLEISCH, ÉMILE CLÉMENT. 1839-1916. Bull. soc. chim. (4) 21:xiii-xxiii (1917); Bull. sci. pharmacol. 23:353-358 (1916). 118 titles.
- KAHLBAUM, GEORG W. A. 1853-1905. Ber. 38:4247-4248 (1905). 25 titles.
- KEHRMANN, F. Gesammelte Abhandlungen. Vol. 1, pt. 1: Untersuchungen über komplexe anorganische Säuren; pt. 2: Untersuchungen über sterische Hinderung. Vol. 2, pt. 1: Untersuchungen über Hydrochinone und Chinone; pt. 2: Untersuchungen über Azine und Azoniumverbindungen. Leipzig, Thieme, 1922-1923.
- KESTNER, AUG. SCHEURER. 1833-1899. Bull. soc. chim. (3) 25:xxiv-xxxi (1901). 135 titles; chronological, 1857-1896.
- KOCH, WALDEMAR. 1875-1912. Biochem. Bull. 1:374-376 (1912). 40 titles.
- KÖNIGS, WILHELM. 1851-1906. Ber. 45:3827-3830. Covers 1874-1908.
- KOSTANECKI, STANISLAUS V. 1860-1910. Ber. 45:1701-1707 (1912). Covers 1884-1910.
- KREMERS, EDWARD. 1865-. J. Am. Pharm. Assoc. 2:728-730 (1913). 78 titles, covering 1886-1912.
- KRUGER, MARTIN. 1866-1904. Ber. 37:4824-4826 (1904). 42 titles.
- LADENBURG, ALBERT. 1842-1911. Ber. 45:3636-3644 (1912). 276 titles, covering 1865-1912.
- LAFONT, JUSTIN. 1855-1917. Bull. sci. pharmacol. 24:321-322 (1917). 25 titles.
- LAIRE, GEORGES DE. 1836-1908. Bull. soc. chim. (4) 5:vii-viii (1909). 23 titles.
- LANDOLT, HANS. 1831-1910. Ber. 44:3387-3394 (1911). Covers 1851-1909.
- LAUTH, CHARLES. 1836-1913. Bull. soc. chim. (4) 21:xv-xviii (1917). Classified by subjects.
- LEA, MATTHEW CAREY. 1823-1897. Nat. Acad. Sci. Biog. Mem. 5:204-208 (1905). 101 titles.
- LEWIN, LOUIS. Pharmakologische und toxicologische Untersuchungen, Abhandlungen und Werke, 18--1907. Berlin, 1908. 14 p.
- LIMPRICHT, HEINRICH. 1827-1909. Ber. 42:5025-5036 (1909). Covers 1850-1901.
- LINDE, C. Naturwissenschaften 5:417-423 (1917). Papers on liquefaction of gases.
- LIPP, ANDREAS. 1855-1916. J. prakt. Chem. 106:105-107 (1923). Chronological.
- LOBRY DE BRUYNS, C. A. 1857-1904. Ber. 37:4855-4860 (1904). Chronological.
- LONG, JOHN H. 1856-1918. Proc. Am. Chem. Soc. 41:78-82 (1919); *also in* Gault, John Harper Long, a tribute, 1921. 117 titles.
- LOSSEN, WILHELM. 1838-1906. Ber. 40:5084-5086 (1907). 58 titles.

- LUZZATTO, RICCARDO. *Biochim. terap.* sper. 10: 37-49 (1923).
- McMURTRIE, WM. 1851-1913. *J. Ind. Eng. Chem.* 5: 617-618 (1913).
- MARC, ROBERT. 1876-1918. *Kolloid-Z.* 23: 84-85 (1918); *Centr. Min. Geol.* 1918: 229-231. 44 titles.
- MARKOWNIKOW, WLADIMIR W. 1838-1904. *Ber.* 38: 4260-4262 (1905).
- MELDOLA, RAPHAEL. 1849-1915. In *Marchant, Raphael Meldola.* 1916, p. 174-225; *Chem.-Ztg.* 40: 345 (1916). 48 titles.
- MENDELEJEFF, DMITRI I. 1834-1909. *Ber.* 41: 4789-4800 (1908). Covers 1854-1907.
- MEYER, CAMILO. *Anales soc. cient. Argentine* 86: 49-84 (1918).
- MEYER, ERNEST V. 1847-1916. *J. prakt. Chem.* 203: 1-36 (1917). *Bibl. footnotes.*
- MEYERHOFFER, WILHELM. 1864-1906. *Ber.* 39: 4476-4478 (1906). Covers 1888-1906.
- MILLER, EDMUND H. 1869-1906. *School Mines Quart.* 28: 139-140 (1907). 26 titles.
- MILLER, WILHELM V. 1848-1899. *Ber.* 32: 3774-3776 (1899). 56 titles, covering 1877-1898.
- MOISSAN, HENRI. 1852-1907. *Bull. soc. chim.* (4) 3: xxv-xxxviii (1908); *Rev. electrochim.* 1: 119-120, 158-159, 289-292 (1907). Covers 1884-1907.
- MOND, LUDWIG. 1839-1909. *Ber.* 43: 3677-3682 (1910).
- MOSES, ALFRED J. *Am. Mineral.* 5: 109-112 (1920). 40 titles.
- MULDER, ED. 1832-1918. *Chem. Weekblad* 15: 1503-1516 (1918). Covers 1857-1910.
- NIEZKI, RUDOLF. 1847-1917. *Helvetica Chim. Acta* 1: 343-432 (1918). *Bibl. footnotes.*
- NOELTING, EMILIO. *Helvetica Chim. Acta* 6: 110-128 (1923); *Bull. soc. chim. ind.* 1922-23: 6-7.
- OSTWALD, W. 1853-. *Z. physik. Chem.* 46: xvi-xxvii (1903). Covers 1875-1903.
- PASTEUR, LOUIS. 1822-1895. *Bull. soc. chim.* (3) 15: xxii-xxxii (1895); *Bull. soc. chim. Belg.* 31: 383-389 (1922). *Chemical works only.*
- PECKELHARING, C. A. *Arch. neer. physiol.* 2: 451-464 (1918).
- PETTENKOFER, MAX V. 1818-1901. *Ber.* 36: 4563-4572 (1903). *Classified by subject.*
- PILOTY, OSKAR. 1866-1916. *Ber.* 53A: 166-168 (1920). Covers 1890-1915.
- POWER, FREDERICK B. 1853-. *Am. J. Pharm.* 96: 605-613 (1924). 127 titles.
- PRESCOTT, A. B. 1832-1905. In *Campbell, History of the Chem. Lab., Univ. of Mich.*, 1916, p. 101-124.
- RAMSAY, WM. 1832-1916. *J. Franklin Inst.* 186: 50-55 (1918); *Bull. soc. chim.* (4) 25: 420-426 (1919).
- REDWOOD, BOVERTON. *J. Inst. Petroleum Tech.* 5: 246-248 (1918-9). 48 titles.
- REGNAULT, VICTOR. 1810-1872 (?). *Rev. gen. chim. pure appl.* 14: 48-50 (1911).
- REICHER, LODEWIJK T. 1883-1908. *Chem. Weekblad* 5: 524-526 (1908). 18 titles.
- REINDERS, W. *Chem. Weekblad* 21: 430-433 (1924).
- RICHARDS, THEODORE W. 1868-. *J. Franklin Inst.* 198: 25-27 (1924). 32 papers on atomic compressibility.
- RICHE, ALFRED. 1829-1908. *Bull. soc. chim.* (4) 3: xii-xiv (1908).
- RITTENHAUSEN, HEINRICH. 1826-1912. *Biochem. Bull.* 2: 339-346 (1913).
- ROOZEBOOM, HENDRIK W. B. 1854-1907. *Ber.* 40: 5170-5174 (1907). Covers 1881-1906.
- ROSENSTIEHL, AUGUSTE. 1839-1916. *Bull. soc. chim.* (4) 21: xx-xxiv (1917). *Classified by subject.*
- ROUSSEAU, GUSTAVE. ?-1897. *Bull. soc. chim.* (3) 19: vi-vii (1898). 34 titles.
- SCHLOTTERBECK, J. O. 1865-1917. In *Campbell, History of the Chem. Lab., Univ. of Mich.*, 1916, p. 127-132.
- SCHMID, JAKOB. 1862-1918. *Helvetica Chim. Acta* 2: 41-43 (1919). 62 titles, covering 1885-1912.
- SCHOTTEN, CARL. 1853-1910. *Ber.* 43: 3703-3714 (1910). *Bibl. footnotes.*
- SCHREINEMAKERS, F. A. H. 1864-. *Chem. Weekblad* 29: 371-374 (1923). 100 titles.
- SCHÜTZENBERGER, PAUL. 1829-1897. *Bull. soc. chim.* (3) 19: xxxiv-xliii (1898).
- SCHULZE, ERNST. 1840-1912. *Biochem. Bull.* 2: 5-20 (1912); *Ber.* 47: 437-449 (1914).
- SKRAUP, ZDENKO H. 1850-1910. *Ber.* 43: 3691-3702 (1910). *Bibl. footnotes.*
- SMITH, ALEXANDER. 1865-1922. *Proc. Indiana Acad. Sci.* 38: 29-34 (1922). 62 titles.
- STEVENS, A. B. 1853-. In *Campbell, History of the Chem. Lab., Univ. of Mich.*, 1916, p. 137-142.
- STORER, FRANCIS H. 1832-1914. *Biochem. Bull.* 4, no. 13: 9-17 (1915).
- STORTENBEKER, WILLEN. 1862-1916. *Rec. trav. chim.* 36: 342-345 (1916). 37 titles.
- TANRET, CHARLES. 1847-1917. *Bull. soc. chim.* (4) 23, no. 11: xxxi-xxxvi (1917); *Bull. sci. pharmacol.* 25: 54-59 (1918). 93 titles.
- TIEMANN, FERD. 1848-1899. *Ber.* 34: 4447-4455 (1901). Covers 1870-1900.

- TSCHIRCH, A. Schweiz. Apoth.-Ztg. 60: 730-739, 742-760 (1922).
- ULPIANI, CELSO. Giorn. chim. appl. 1: 69-76 (1920).
- VERNEUIL, AUGUSTE. 1856-1913. Bull. soc. chim. (4) 13; no. 15: vii-x (1913). 38 titles.
- VIEHOEVER, ARNO. Am. J. Pharm. 95: 761-763 (1923).
- VINCENT, CAMILLE. 1839-1910. Bull. soc. chim. (4) 9: v-vii (1911). 35 titles, covering 1872-1898.
- VOLHARD, JACOB. 1834-1910. Ber. 45: 1899-1902 (1912). Covers 1861-1909.
- WAGNER, GEORG. 1849-1903. Ber. 36: 4609-4613 (1903).
- WALDEN, PAUL. J. Ind. Eng. Chem. 5: 613-614 (1913). Principal publications.
- WASHBURN, EDWARD W. 1881-. J. Am. Ceram. Soc. 5: 59-63 (1922).
- WEIDEL, HUGO. 1849-1899. Ber. 32: 3752-3755 (1899). Covers 1869-1899.
- WELLS, HORACE L. 1855-1924. Am. J. Sci. (5) 9: 192-194 (1925). 75 titles.
- WEIMARN, P. P. von. Rev. gen. colloidales 2: 225-228 (1924).
- WERNER, ALFRED. 1866-1919. Helvetica Chim. Acta 3: 225-232 (1920). 200 titles, covering 1890-1917.
- WEYL, THEODOR. 1851-1913. Ber. 47: 2395-2404 (1914). Bibl. footnotes.
- WHITE, ALFRED H. In Campbell, History of the Chem. Lab., Univ. of Mich., 1916, p. 155-160.
- WILL, WILHELM. 1854-1919. Ber. 54A: 265-268 (1921). 84 titles, covering 1873-1919.
- WINKLER, CLEMENS. 1838-1904. Ber. 39: 4543-4548 (1906).
- WISLICENUS, JOHANNES. 1835-1902. Ber. 37: 4928-4946 (1904). Covers 1857-1902.
- WITT, OTTO N. 1853-1915. Ber. 49: 1825-1832 (1916). 108 titles.
- WYROUBOFF, GREGOIRE. 1843-1913. Bull. soc. chim. (4) 15: xv-xxi (1914).

BULLETIN
OF THE
NATIONAL RESEARCH COUNCIL

June, 1929

Number 71

BIBLIOGRAPHY OF BIBLIOGRAPHIES ON CHEMISTRY
AND CHEMICAL TECHNOLOGY

First Supplement
1924-1928

Compiled for Research Information Service

BY

CLARENCE J. WEST,

*Director, Research Information Service,
Associate Editor, International Critical Tables*

AND

D. D. BEROLZHEIMER,

*Chemical Literature Expert,
50 E. 41st St., New York, N. Y.*

PUBLISHED BY THE NATIONAL RESEARCH COUNCIL
OF
THE NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D. C.

1929

PREFACE

This Bulletin is a supplement to the Bibliography of Bibliographies on Chemistry and Chemical Technology, published in 1925 as Bulletin No. 50 of the National Research Council. Although most of the bibliographies listed have been published since 1924, many older ones have been included so as to make the united publication as complete as possible.

It is suggested that users in search of information consult both this Bulletin and Bulletin No. 50. Subject headings appearing for the first time have been indicated with an asterisk.

The compilers will appreciate it if errors in or omissions of published bibliographies are called to their attention.

CLARENCE J. WEST
D. D. BEROLZHEIMER

WASHINGTON, D. C.
NEW YORK, N. Y.
June 1, 1929.

GENERAL BIBLIOGRAPHIES

- BIBLIOGRAPHIA TECHNICA; internationaler Literatur-Anzeiger für die gesamte Technik und ihre Grenzgebiete. 1.-2. Jahrg.; Jan./März. 1924-Nov./Dez. 1925. Berlin, VDI-Verlag, G.m.b.H. 1924-1925. Issued with Technische Zeitschriftenschau, 9-10 Jahrg., 1924-1925. No more published.
- BROWN, R. N. Recent technical bibliographies. Library J. 51: 232-236, 427-428 (Mar., May, 1926).
- CADE, A. R. Searching chemical literature. Chem. Met. Eng. 29: 799 (Oct. 29, 1923).
- CRANE, EVAN J., and PATTERSON, AUSTIN M. A guide to the literature of chemistry. N. Y., Wiley, 1927. 438 p.
- DARROW, FLOYD L. The story of chemistry. Indianapolis, Bobbs-Merrill, 1927. 528 p. Bibl., p. 497-511.
- DEMING, HORACE G. General chemistry; an elementary survey, emphasizing industrial applications of fundamental principles. 2nd ed. N. Y., Wiley, 1925. 650 p. Bibl., p. 629-632.
- DETROIT PUBLIC LIBRARY. Chemistry: selected list of books. 1915. 24 p.
- FOSTER, WILLIAM. The elements of chemistry. N. Y., Van Nostrand, 1925. 576 p. Bibl., p. 558-560.
- FOSTER, WILLIAM. The romance of chemistry. N. Y., Century, 1927. 468 p. Bibl., p. 449-457.
- GATES, ELIZABETH. Union list of chemical periodicals in the Cincinnati libraries. Cincinnati, University of Cincinnati, 1925. 58 p.
- GMELIN, LEOPOLD. Gmelin's Handbuch der anorganischen Chemie. 8. Aufl. Leipzig-Berlin, Verlag Chemie G.m.b.H., 1924—.
- GRAY, CARL WILLIAM, *et al.* Fundamentals of chemistry. Boston, Houghton-Mifflin, 1929. 650 p. Bibl. at end of some chapters and p. 633-635.
- HALEM, G. A. v. Bremer Literaturberichte für Technik, Chemie und verwandte Gebiete. 1.-2. Jahrg.; Juli 1921-Dez. 1922. Bremen, 1921-1922. 2v. in 1.
- HIBBERT, H. The art of searching chemical literature. Chem. Met. Eng. 20: 578-581 (1919).
- HOLMES, HARRY N., and MATTERN, LOUIS W. Elements of chemistry. N. Y., Macmillan, 1927. 519 p. Contains bibls.
- JOB, PAUL. Les méthodes physiques appliquées à la chimie. Paris, Doin, 1926. 251 p. Bibl. footnotes.
- MCCLENDON, JESSE F., and MEDES, GRACE. Physical chemistry in biology and medicine. Philadelphia, Saunders, 1925. 425 p. Contains bibls.
- MCPHERSON, WILLIAM, and HENDERSON, WM. E. Chemistry and its uses; a textbook for secondary schools. Rev. ed. Boston, Ginn, 1926. 460 p. Bibl., p. 441-443.
- MASON, FREDERICK A. An introduction to the literature of chemistry for senior students and research chemists. Oxford, Clarendon Press, 1925. 41 p.
- MELLON, MELVIN G. Chemical publications, their nature and use. N. Y., McGraw-Hill, 1928. 253 p.
- MILLARD, EARL B. Physical chemistry for colleges; a course of instruction based upon the fundamental laws of chemistry. 2nd ed. N. Y., McGraw-Hill, 1926. 458 p. Bibl. at end of some of the chapters.
- MURRAY, R. H. Science and scientists in the nineteenth century. London, Sheldon Press, 1925. 450 p. Bibl., p. 409-425. About 500 references, mostly books.
- NATIONAL RESEARCH COUNCIL. *Division of chemistry and chemical technology*. A survey of American chemistry . . . including reports from scientific committees. Division of chemistry and chemical technology, National Research Council . . . N. Y., Chem. Cat. Co., 1927—. Bibl. footnotes.
- OSTWALD, WILHELM. Ostwald-Luther Hand- und Hilfsbuch zur Ausführung physikochemischer Messungen. 4. neubearb. Aufl. Leipzig, Akademische Verlagsges. m.b.H., 1925. 814 p. Bibl. footnotes.
- PERROT, ÉMILE. Conseils aux étudiants des laboratoires de recherches scientifiques pour la bibliographie appliquée à l'histoire naturelle et à la pharmacologie des drogues simples d'origine végétale. Paris, Librairie le Francois, 1924. 41 p.
- QUARTERLY CUMULATIVE INDEX MEDICUS. v. 1—. Jan., 1927—. Chicago, American Medical Assoc., 1927. Formed by the union of the Index medicus and the Quarterly cumulative index to current medical literature.

- SCHLESINGER, HERMANN I. General chemistry. N. Y., Longmans, 1925. 631 p. Bibl., p. 605-608.
- SILVERMAN, ALEXANDER, *et al.* A series of seven radio talks on chemistry and human progress (with select bibliographies). Bibliographies prepared in collaboration with the staff of the Technology department of the Carnegie Library of Pittsburgh. Pittsburgh, 1926. 57 p.
- SMITH, EDGAR F. Old chemistries. N. Y., McGraw-Hill, 1927. 89 p.
- STEGEMAN, GEBHARD, *et al.* A series of eight radio talks entitled: Leaves from the notebook of the chemist (with select bibliographies). Pittsburgh, 1928. 73 p.
- TRIPP, NEWELL R. The A B C of chemistry. N. Y., Vanguard Press, 1927. 119 p. Bibl., p. 107-113.
- UNITED STATES. *Department of Chemistry. Library.* List of manuscript bibliographies and indexes in the U. S. Department of Agriculture. 1926. 202 entries.
- WORDEN, EDWARD C. Chemical patents index; a comprehensive and detailed index of the subject matter of specification and claims of United States patents and patent reissues granted during the decennial period 1915-1924 inclusive, covering the entire field of chemical technology; comprising the ramifications of patented inorganic and organic chemical processes and products as applied to biology, microscopy, botany, mineralogy, pharmacy, medicine, photography, and dyestuffs in both the warlike and peaceful arts. Vol. 1 (Covers subjects beginning with A and B, with A-Z inventor index). N. Y., Chem. Cat. Co., 1927. (To be complete in 5 vols.)

BIBLIOGRAPHIES ON SPECIAL SUBJECTS

ABIETIC ACID

LEVY, P. Ein kurzer Beitrag zur Geschichte der Abietinsäure. *Z. angew. Chem.* 41: 233-234 (1928). 25 references.

See also RESINS; ROSIN.

ABSORPTION: Physical. See ADSORPTION.

ABSORPTION: Physiological.

CUNNINGHAM, R. S. The physiology of the serous membranes. *Physiol. Rev.* 6: 272-280 (1926). 145 references.

See also METABOLISM.

ABSORPTION SPECTRA. See SPECTROSCOPY.

ACCELERATORS

ALADIN, —. Vulkanisationsbeschleuniger. Ein Ueberblick der Patent Literatur der letzten Jahre. *Gummi-Ztg.* 41: 2863-2865, 2923-2925, 2976-2978; 42: 246-247 (1927). 245 patents.

BOUVIER, L. Les accélérateurs dans l'industrie du caoutchouc. *Rev. gén. mat. plastiques* 2: 167-168 (1926). 137 references.

Organic rubber accelerators. *Ind. Eng. Chem.* 18: 316-317 (1926). List of 94 substances with name of inventor, patent number and date of patent.

STOLL, L. Accelerators and their use. *Rubber Age* 17: 407-410, 418 (1925). 133 references.

See also RUBBER; VULCANIZATION.

ACETALS

HALBERKANN, JOSEF. Acetalieren. In Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 2, 1st half: 1047-1138 (1927). Bibl. footnotes.

MEERWEIN, HANS. Die Alkoxy- und Oxydo- (Alkylenoxyd) Gruppe. In Houben-Weyl, *Meth. org. Chem.*, 2nd ed., II: 103-175 (1923). Bibl. footnotes.

ACETIC ACID

KESSLER, VIKTORIA. Die Essigsäure, ihre Gewinnung und wirtschaftliche Bedeutung. Berlin, Krayn, 1922. 118 p. Bibl., p. 118.

See also WOOD DISTILLATION.

ACETONE OIL. See WOOD DISTILLATION.

ACETYLATION *

HALBERKANN, JOSEF. Acylieren. II. In Abderhalden, *Handb. biol. Arbeitsm.*

1, pt. 2, 1st half: 863-1046 (1927). Bibl. footnotes.

WREDE, F. Acylieren. In Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 1: 719-774 (1925). Bibl. footnotes.

ACETYLENE. See CARBIDES.

ACIDOSIS

LABBÉ, MARCEL. Acidose et alcalose; physiologie - pathologie - thérapeutique. Paris, Masson, 1928. 295 p. Bibl. at end of most of the chapters.

See also ALKALOSIS.

ACIDS, ALKALIS, SALTS

PARTINGTON, JAMES R. The alkali industry. 2nd ed. N. Y., Van Nostrand, 1925. 344 p. References at end of each section.

SOCIETY OF CHEMICAL INDUSTRY. Acids, alkalis, salts, etc. In Reports of the progress of applied chemistry 10: 188-219 (1925); 126 footnotes. 11: 167-198 (1926); 146 footnotes. 12: 170-200 (1927); 119 footnotes. 13: 180-215 (1928); 244 footnotes.

WAESER, BRUNO. Schwefelsäure, Sulfat, Salzsäure. Fortschritte der Chem. Technologie in Einzeldarstellungen. Band XII. Dresden and Leipzig, Steinkopff, 1927. 131 p. The book is replete with references, especially to the patent literature of Germany.

See also Names of the individual acids, alkalis and salts.

ACIDS: Organic

BOAS, F. Organische Säuren. In Wiesner, *Die Rohstoffe des Pflanzenreiches*, 2nd ed., 1810-1811 (1928). 67 references.

HOLDE, D. Ueber die Anhydride aliphatischer Fettsäuren. *Chem.-Ztg.* 50: 994-996 (1926). 30 footnotes.

POSNER, THEODOR. Die Carboxylgruppe. In Houben-Weyl, *Meth. org. Chem.*, 2nd ed., III: 631-752 (1923). Bibl. footnotes.

ACRIDINE

HOLLINS, C. Acridine. In his *Synthesis of nitrogen ring compounds*, 1924, p. 331-381. Bibl. footnotes and patents.

LAUFFER, PAUL. Researches in the acridine series: Preparation of an isomer of proflavine and of acriflavine. Thesis, Columbia University, 1926. 27 p. Bibl., 3 p. at end.

ACTINIUM

ELSEN, G. Das Aktiniumproblem. *Z. anorg. allgem. Chem.* 180:304-320 (1929). 61 footnotes.

See also RADIUM.

ACTINOMETERS *

ATHANASIU, GEORGES. Contribution a l'étude des actinomètres électrochimiques. *Ann. phys.* 4:420-424 (1925). 78 references.

ADENASE. *See* AMIDASES.**ADHESIVES**

ALEXANDER, JEROME. Adhesives and gelatins. International critical tables II: 230 (1927). 56 references.

ALEXANDER, JEROME. Starch and flour adhesives. In Walton, A comprehensive survey of starch chemistry, 1: 186-187 (1928). 60 patent references.

LEIT, —. Klebemittel, zusammengestellt nach den deutschen Patenten der letzten Jahre. *Kunststoffe* 16:189-191, 223-225 (1926). Patents through text.

VAIL, JAMES G. Adhesives. In *his* Soluble silicates in industry, 1928, p. 210-251. 105 footnotes.

See also CASEIN; GELATIN; GLUE; SILICATES; STARCH.

ADRENALINE

CORI, CARL F., and CORI, GERTY T. The mechanism of epinephrine action. *J. Biol. Chem.* 79:318-319, 340-341, 355 (1928). 66 references.

GELLHORN, ERNST. Methoden zum Nachweis des Adrenalins. In *Abderhalden, Handb. biol. Arbeitsm.* V, pt. 3B: 269-284 (1926). Bibl. footnotes.

HIRSCH, RAHEL. Das Adrenalsystem. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 9:256-280 (1926). 105 footnotes.

See also SUPRARENALS.

ADSORPTION

Adsorption. In *Tables annuelles* VI: 1205-1225 (1923-1926).

BRAITHWAITE, LESLIE V. A study of the adsorption of zinc sulphite by copper sulphite in moderately strong acid solutions. Thesis, Columbia University, 1925. 42 p. Bibl., p. 43.

BRUINS, B., and FRUMKIN, A. Ueber den Zusammenhang zwischen der Gasbeladung und der Adsorption von Elektrolyten durch aktivierte Kohle. *Z. physik. Chem.* 141A:141-157 (1929). 50 footnotes.

DONALD, M. B., and TYSON, C. W. A study of the absorption tower. *Trans. Inst. Chem. Eng.* 1923, I:93-94. 16 references.

FLEISCHER, ARTHUR. The adsorption of vapors. *Am. J. Sci.* 16:257-258 (1928).

FREUNDLICH, H. Adsorption and its significance. In *Alexander, Colloid chemistry* I: 597-599 (1925). 75 references.

GROSS, JOHN, and SCOTT, J. WALTER. Precipitation of gold and silver from cyanide solution on charcoal. Bureau of Mines, Tech. Paper 378. 1927. 78 p. Bibl., p. 73-78. 101 references.

GUSTAV, BROR. Beiträge zur Kenntnis des Adsorptionsproblems. Die Sorption von Dämpfen durch Kohle. *Kolloidchem. Beihefte* 15:185-338 (1922). Bibl. footnotes.

HAUGE, SIGFRED M. Studies in adsorption with carbons. Thesis, University of Minnesota, 1926. 27 p.; *Ind. Eng. Chem.* 19:953 (1927). 64 references.

HORTON, PAUL MCH. Gold adsorption by alkaline charcoal. Thesis, Columbia University, 1925. 31 p. *Reprinted from Chem. Met. Eng.* 32, nos. 1, 2 and 4, Jan. 5, 12 and 26, 1925. References, p. 10, 30.

KOLTHOFF, I. M. Die Elektrolytadsorption an reiner aschenfreier Kohle. *Rec. trav. chim.* 46:549-573 (1927). 34 footnotes.

LEWIS, W. K., and WHITMAN, W. G. Principles of gas absorption. *Ind. Eng. Chem.* 16:1220 (1924). 12 references.

MILLER, E. J. Adsorption by activated sugar charcoal, with particular reference to adsorption and soil acidity. *Mich. Agr. Expt. Sta., Tech. Bull.* 73: 59-60 (1925).

MILLER, E. J. Adsorption from solution by ash-free adsorbent charcoal. Colloid symposium monograph 5:55-80 (1928). 41 footnotes.

MUELFARTH, P. Ueber Adsorption von Gasen an Glaspulver. *Ann. Phys.* (4) 3:328-329, 352 (1900).

MÜLLER, E., and SCHWABE, K. Die Aufnahmefähigkeit der Platinmetalle für Wasserstoff. *Z. Elektrochem.* 35: 165 (1919). 70 footnotes.

OSTWALD, WOLFGANG, and DE IZAGUIRRE, RAMON. Ueber eine allgemeinere Theorie der Adsorption von Lösungen. *Kolloid-Z.* 30:279-306 (1922). 48 footnotes.

PINKUS, A., and BROUCKERE, L. de. Sur l'adsorption des électrolytes par les surfaces cristallines. *J. chim. phys.* 25:605-640 (1928). Bibl. footnotes.

RIDEAL, E. K. Adsorption at solid surfaces and solubility of gases in metals of the platinum group. International critical tables III:253-254 (1928). 102 references.

- SAUTER, ERWIN R. Katalyse und Adsorption. *Kolloid-Z.* 46:148-155 (1928). 53 footnotes.
- SWAN, ENOCH, and URQUHART, ALEX. R. Adsorption equations. A review of the literature. *J. Phys. Chem.* 31: 275-276 (1927). 117 references.
- WEISER, HARRY B. Adsorption by precipitates. In Alexander, *Colloid chemistry I*: 617-618 (1926). 60 references.
- See also CARBON: ACTIVATED; COLLOIDS.
- ADSORPTION, Heat of.***
- KRUYT, H. R., and MODDERMAN, J. G. Heats of adsorption and of wetting. *International critical tables V*: 142, 143 (1929). 53 references.
- AGAR-AGAR**
- HARVEY, ELLERY H. Agar. *Am. J. Pharm.* 97: 453-456 (1925). 64 references.
- AGGLUTINATION. See IMMUNITY.**
- AGRICULTURAL CHEMISTRY**
- HONCAMP, FRANZ, and NOLTE, O. *Agrikulturchemie*. Dresden and Leipzig, Steinkopff, 1924. 160 p. Bibl. footnotes.
- OGDEN, ELISE L., and HAWKES, EMMA B. List of manuscript bibliographies and indexes in the U. S. Department of Agriculture, including serial mimeographed lists of current literature. Washington, 1926. 38 p. (U. S. Dept. of Agr., Library. Bibliographical contributions no. 11). Mimeographed.
- PETCH, THOMAS. Bibliography of books and papers relating to agriculture and botany to the end of the year 1915. H. R. Cottle, government printer, Government printing dept., Colombo, Ceylon, 1925. 256 p.
- Published contributions for the college of agriculture. *Philippine Agr.* 16: 189-222 (1927). 789 references, many of chemical interest.
- WIEGNER, GEORG, and JENNY, HANS. *Anleitung zum quantitativen agrikulturchemischen Praktikum*. Berlin, Borntraeger, 1926. 348 p. Literature, p. 1-3.
- See also DAIRY PRODUCTS; FERTILIZERS; SOILS.
- AIR**
- MELLOR, J. W. The physical properties of air. In *his Inorg. theor. chem.* 8: 38-45 (1928).
- See also ATMOSPHERE.
- AIR: Liquid**
- DIEDERICH, H. Flüssige Luft als Sprengstoff: ihre Erzeugung und Verwendung. *Z. kompr. flüss. Gase* 18: 94-101, 127-130, 149-157 (1918). Bibl. of 30 references, p. 156-157.
- KAUSCH, O. Die Herstellung, Verwendung und Aufbewahrung von flüssiger Luft. 5th ed. Weimar, Steinert, 1919. 553 p. Bibl., p. 461-463. List of patents, p. 536-544.
- SELMANN, A. Ein Beitrag zur Theorie der Luftverflüssigung nach Linde und Claude. *Z. ges. Kälte-Ind.* 29: 150 (1922). 35 references.
- ALBITE**
- FISCHER, H. Ueber die optischen Eigenschaften des Albits. *Z. Krist.* 61: 226-227 (1925). 24 references.
- See also FELDSPAR.
- ALBUMIN**
- HOLLANDE, AUGUSTIN C. Albuminurie simulée et recherche de l'ovalbumine dans l'urine. (Procédés chimiques et réaction spécifique des précipitines). Nancy, Crepin-Leblond, 1919. 114 p. Bibl., p. 110-114.
- KOMM, ERNEST. Eiweissbildung bei Tier und Pflanze. Freising-München, Datterer, 1925. 62 p. Literature, p. 60-62.
- See also PROTEINS.
- ALCHEMY**
- BISCHOFF, ERICH. Der Sieg der Alchymie; das wiederentdeckte Geheimnis, aus unedlen Metallen echtes Gold zu machen; eine Wanderung aus Nacht zum Licht. 1. und 2. Aufl. Berlin, Barsdorf, 1925. 160 p. Literature, p. 151-156.
- JOHNSON, OBED SIMON. A study of Chinese alchemy. Shanghai, China, The Commercial Press, 1928. 156 p. Bibl., p. 129-143.
- UVAROV, ALEKSEĬ SERGĬEVICH. Sciences secrètes. Moscou, Imprimerie W. Gautier, 1870. 217 p. Classified with indexes of names and of titles of anonymous works.
- ALCOHOLS**
- BROOKS, BENJ. T. The manufacture of alcohols from hydrocarbons, with particular reference to petroleum as a raw material. *Chem. Reviews* 2: 369-394 (1926). 86 references.
- ALDEHYDES**
- SCHMIDT, JUL. Aldehyd- und Keton-Gruppe. In *Houben-Weyl, Meth. org. Chem.*, 2nd ed., III: 377-476 (1923). Bibl. footnotes.
- ALKALI MELT***
- MASCHMANN, ERNST. Aetzalkalischmelze. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 2, 1st half: 463-514 (1927). Bibl. footnotes.
- ALKALI METALS. See LITHIUM; SODIUM.**
- ALKALI METALS: Organic Compounds.***
- See ORGANOMETALLIC COMPOUNDS.

ALKALINE EARTH METALS

BURR, MAY S. The alkaline earth metals. London, Griffin, 1925. 346 p. (A text-book of inorganic chemistry, ed. by J. Newton Friend. vol. 3, pt. 1). Bibl. footnotes.

REGELSBERGER, FRIEDRICH F. Chemische Technologie der Leichtmetalle und ihrer Legierungen. Leipzig, Spamer, 1926. 385 p. Bibl., p. 13-20, and in footnotes.

ALKALOIDS

BOAS, F. Alkaloide. In Wiesner, Rohstoffe des Pflanzenreiches, p. 56-59 (1927). 191 references.

CATTELANI, E. Les alcaloïdes de la Lobélie enflée (*Lobelia inflata* L.). J. pharm. chim. 4: 408-409 (1926). 30 references.

SCHMIDT, JULIUS, and GRAFE, VIKTOR. Alkaloide. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 9: 1-636 (1920). Bibl. footnotes.

SEKA, REINHARD. Alkaloide. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 11: 217-632 (1927). Bibl. footnotes. See also names of individual alkaloids; PHARMACEUTICALS; TOXICOLOGY.

ALKALOSIS *

KOEHLER, ALFRED E. Acid-base equilibrium. I. Clinical studies in alkalosis. Arch. Internal Med. 31: 590-605 (1923). 28 footnotes.

See also ACIDOSIS.

ALKYLATION *

HALBERKANN, JOSEF. Alkylieren. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2, 1st half: 643-862 (1927). Bibl. footnotes.

ALLOYS

AMERICAN SOCIETY FOR TESTING MATERIALS. Corrosion-resistant, heat-resistant and electrical-resistance alloys; a symposium held at the 1924 annual meeting of the American Society for Testing Materials, Philadelphia, 1924. 269 p. Reprinted from Proceedings of the American Society for Testing Materials, vol. 24, part 2 (1924). Selected bibl., p. 88; references, p. 119.

CREPAZ, E. Il sistema ternario alluminio-zinco-stagno. I. I sistemi binari stagno-zinco e alluminio-stagno. II. Il sistema binario alluminio-zinco e il sistema ternario zinco-alluminio-stagno. Giorn. chim. ind. appl. 5: 115-122, 285-290 (1923). 32 footnotes.

GAYLER, M. L. V. Aluminium alloys. Equilibrium diagrams. International critical tables II: 400 (1927). 46 references.

HADFIELD, W. H. Alloys of iron and tungsten. J. Iron Steel Inst. 64: 14-118 (1903). Bibl., p. 76-79.

HAUGHTON, J. L. Non ferrous alloys. Equilibrium diagrams. International critical tables II: 419-420 (1927). 149 references.

HUDSON, O. F. Lead alloys and tin alloys. Equilibrium diagrams. International critical tables II: 413 (1927). 46 references.

JENKINS, C. H. M. Constitution and physical properties of some alloys of copper, zinc and cadmium. J. Inst. Metals 38: 302-303 (1927). 15 references.

REGELSBERGER, FRIEDRICH F. Chemische Technologie der Leichtmetalle und ihrer Legierungen. Leipzig, Spamer, 1926. 385 p. Bibl., p. 13-20, and in footnotes.

REINGLASS, P. Chemische Technologie der Legierungen. Leipzig, Spamer, 1927. 538 p. Patent index.

See also Names of Metals; BRASS; BRONZE; ELECTROLYTES (Kre-mann); METALLOGRAPHY; METALLURGY.

ALUM

RICHARDSON, WILLIAM D. The current significance of the word alum. Chicago, Commonwealth Press, 1927. 93 p. Bibl., p. 63-93.

SMITH, ERNEST E. Aluminium compounds in food, including a digest of the report of the Referee Board of Scientific Experts on the influence of aluminium compounds on the nutrition and health of man. N. Y., Hoeber, 1928. 378 p. Bibl., p. 349-355.

ALUMINIUM

ANDERSON, R. J. Aluminium and bauxite. Min. Ind. 33: 47-50 (1924). About 50 references for 1924.

ANDERSON, R. J. The metallurgy of aluminium and aluminium alloys. N. Y., Baird, 1925. 913 p. Bibl., p. 28-30, 70-72.

ANDERSON, R. J. Metallurgy of aluminium and aluminium alloys. In Liddell, Non-ferrous metallurgy, II: 75-77 (1926). 144 references.

ANDERSON, ROBERT J. Linear contraction and shrinkage of a series of light aluminium alloys. Trans. Am. Foundrymen's Assoc. 31: 463-466 (1924). 52 references.

ANDERSON, ROBERT J., and BOYD, M. E. Salvage and reclamation of aluminium-alloy castings by soldering and welding. Trans. Am. Foundrymen's Assoc. 32, pt. 1: 424-425 (1924). 25 references.

- ANDERSON, ROBERT J., and BOYD, M. E. The production of aluminium alloy pistons in permanent molds. *Trans. Am. Foundrymen's Assoc.* 32, pt. 1: 284-286 (1924). 31 references.
- GUILLET, LEON. New aluminium alloy—alpax. *Trans. Am. Foundrymen's Assoc.* 32, pt. 1: 343-344 (1924). 21 references.
- RUMBOLD, W. Bauxite and aluminium. London, Murray, 1925. 110 p. 114 references, arranged by country, p. 105-110.
- SACHS, G. Die technologischen Eigenschaften von Aluminiumkristallen. *Z. Ver. deut. Ing.* 71: 577-584 (1927). 52 footnotes.
- SULFRAIN, A. Raw materials for the production of aluminium. *Continental Met. Chem. Eng.* 2: 172-175 (1927). Patent review.
- UNITED STATES. *Bureau of Standards*. Light metals and alloys. Aluminium. Magnesium. 2nd ed., December 12, 1927. Washington, Govt. print. off., 1927. 403 p. (Circular of the Bureau of Standards, no. 346). *Bibl.*, p. 326-397.
- See also BRONZE; ELECTROPLATING (Regelsberger).
- ALUMINIUM: Physiological effect.**
- MYERS, VICTOR C., MULL, JAMES W., and MORRISON, DEMPSE, B. Aluminium in the animal organism. I. The estimation of aluminum in animal tissues. II. The influence of the administration of aluminum upon the aluminum content of the tissues and upon the growth and reproduction of rats. *J. Biol. Chem.* 78: 604-613 (1928).
- STOKLASA, JULIUS. Ueber die Verbreitung des Aluminiums in der Natur und seine Bedeutung beim Bau- und Betriebsstoffwechsel der Pflanzen. Jena, Fischer, 1922. 500 p. Literature, p. 465-495.
- See also ALUM.
- ALUMINUM ARSENATES.** See ARSENATES.
- ALUMINUM HYDROXIDE**
- GANN, J. A. Ueber die Koagulationsgeschwindigkeit des $Al(OH)_3$ sols. *Kolloidchem. Beihefte* 8: 63-138 (1916). *Bibl. footnotes*.
- ALUMINUM SILICATES**
- GRUNER, E. Zur Kenntniss der Ultramarine. *Z. angew. Chem.* 41: 446-450 (1928). 31 references.
- MELLOR, J. W. The alkali aluminium silicates. *In his Inorg. theor. chem.* 6: 594-603; 655-661 (1925). About 2,000 references.
- MELLOR, J. W. The alkaline earth aluminium silicates. *In his Inorg. theor. chem.* 6: 768-802 (1925). About 5,000 references.
- MELLOR, J. W. Aluminium silicates. *In his Inorg. theor. chem.* 6: 462-467 (1925). About 500 references.
- MELLOR, J. W. Beryllium-aluminium silicates. *In his Inorg. theor. Chem.* 6: 806-808 (1925). About 150 references.
- MELLOR, J. W. Hydrated aluminum silicates. *Clays. In his Inorg. theor. chem.* 6: 500-511 (1925). About 1,500 references.
- See also FELDSPARS; SILICATES.
- AMALGAMS**
- KOBAYASHI, M. On the amalgam methods. The Sexagint, dedicated to Y. Osaka, Kyoto, 1927, p. 95-102. 31 references on application of liquid amalgams, p. 102.
- MELLON, M. G. Methods of determining the composition of amalgams. *Proc. Indiana Acad. Sci.* 34: 160-162 (1924). 103 references.
- AMIDASES**
- OPPENHEIMER, CARL. Amidasen und Aminoacidasen. *In his Die Fermente*, p. 778-802 (1926). 224 footnotes.
- See also ENZYMES.
- AMINES**
- MELLOR, J. W. The substituted ammonias—The amines, amides, and imides. *In his Inorg. theor. chem.* 8: 274-275 (1928).
- ROSENMUND, KARL W., and HARMS, H. Tertiäre Amine und Ringbasen. *In Houben-Weyl, Meth. org. Chem.* 4: 469-526 (1924). *Bibl. footnotes*.
- SICKEL, HANS. Aminieren und Amidieren. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 2, 2nd half: 1139-1338 (1927). *Bibl. footnotes*.
- See also AMMINES.
- AMINO ACIDS**
- HOUBEN, J. Aminogruppe und Iminogruppe. *In Houben-Weyl, Meth. org. Chem.* 4: 233-468 (1924). *Bibl. footnotes*.
- KIRK, P. L., and SCHMIDT, CARL L. A. The apparent dissociation constants of the amino acids and certain related substances. *Univ. Calif. Publs. in Physiol.* 7: 61-62 (1929). 57 references.
- MITCHELL, H. H., and HAMILTON, T. S. The biochemistry of the amino acids. New York, Chem. Cat. Co., 1929. 619 p. 1600 *bibl. footnotes*. *Special bibls.* Determination of individual amino acids, p. 192-194; 108 references. Preparation of amino acids, p. 195-201; 120 references.

AMINO ACIDS—Cont'd

ROSENMUND, K. W. Aminosäuren und Polypeptide. *In* Houben-Weyl, Meth. org. Chem. 4: 527-589 (1924). Bibl. footnotes.

AMINOCRESOL *

CONNITT, GEORGE H. A study of some of the reactions of 6-amino-*m*-cresol. Thesis, Columbia University, 1928. 46 p. Bibl., p. 45-46.

AMINOSULFINIC ACID *

MELLOR, J. W. Amidosulphinic acid and its salts. *In his* Inorg. theor. chem. 8: 637 (1928). About 25 references.

AMINOSULFONIC ACID *

MELLOR, J. W. Amidosulphonic acid and its salts. *In his* Inorg. theor. chem. 8: 645 (1928). About 50 references.

AMMINES

MELLOR, J. W. The metal ammines, or metal ammoniates. *In his* Inorg. theor. chem. 8: 251-252 (1928). About 50 references.

SUTHERLAND, M. M. J. The metal-ammines. London, Griffin, 1928. 260 p. (Vol. X of Friend's Text-book of Inorganic Chemistry.) Bibl. footnotes.

AMMONIA

MELLOR, J. W. Ammonia. *In his* Inorg. theor. chem. 8: 146, 148, 168-173, 190-194, 204-205, 225-228, 242-243 (1928).

PRIDEAUX, EDMUND B. R., and LAMBOURNE, HERBERT. Ammonia. *In* Friend, Textbook of inorg. chem., VI, pt. 1: 62-114 (1928). Bibl. footnotes.

VAN DER WYK, A. J. A. La formation de l'ammoniac dans l'effluve électrique en présence de mercure. *J. chim. phys.* 25: 287-289 (1928). 81 references.

See also ACIDS, ALKALIS, SALTS; NITROGEN.

AMMONIUM ARSENATES. *See* ARSENATES.**AMMONIUM NITRATE**

ESCALES, R. Die Explosivstoffe. IV. Ammonsalpetersprengstoffe. Leipzig, Veit, 1909. 239 p. Bibl., p. 226-228. Patents, p. 229-230.

AMNIOTIC FLUID

ZUNTZ, LEO. Fruchtwasser. *In* Oppenheimer, Handb. Biochem. 5: 594-610 (1925). 76 footnotes.

AMYLASE

KUHN, RICHARD. Der Wirkungsmechanismus der Amylasen; ein Beitrag zum Konfigurationsproblem der Stärke. *Ann.* 443: 1-71 (1925). Bibl. footnotes.

MUHFELD, MARIE. Experiments on blood amylases. Thesis, Columbia Univ., 1928. 25 p. Bibl., p. 24-25.

See also DIASTASE; ENZYMES; STARCH (Walton).

ANALCITE.* *See* ALUMINUM SILICATES.**ANALYTICAL CHEMISTRY**

AUERBACH, FR., and SMOLCZYK, E. Zur Theorie und Praxis der elektrometrischen Säuretitration. *Z. physik. Chem.* 110: 65-141 (1924). Bibl. footnotes.

BASSETT, HENRY. The colloidal aspect of analytical chemistry. *In* Alexander, Colloid chemistry I: 940-943 (1926). 198 references.

CONGDON, L. A., GUSS, A. B., and WINTER, F. A. Critical studies on methods of analysis. *Chem. News* 131: 65-68, 81-84, 97-100, 113-117 (1925). 108 references.

CUMMER, CLYDE L. A manual of clinical laboratory methods. 2nd ed. Philadelphia, Lea & Febiger, 1926. 547 p. Bibl., p. 517-528.

DANCKWORTT, P. W. Lumineszenzanalyse im filtrierten ultravioletten Licht. Leipzig, Akad. Verlagsges., 1928. 106 p. 200 references.

DÖRING, TH. Fortschritte auf dem Gebiete der Metallanalyse. 1924. *Chem.-Ztg.* 49: 1009-1012, 1030-1033, 1037-1040, 1045-1048, 1061-1064, 1072-1073 (1925); 200 footnotes. 1925. *Ibid.* 50: 897-899, 906-909, 917-918, 934-936, 942-943, 949-953, 971-973 (1926). 233 footnotes.

GOTSCHLICH, EMIL. Handbuch der hygienischen Untersuchungsmethoden. Jena, Fischer, 1926-1927. 3 v. Bibliographies interspersed.

GRIFFIN, ROGER C. Technical methods of analysis, as employed in the laboratory of Arthur D. Little, Inc., Cambridge, Mass. 2nd. ed. N. Y., McGraw-Hill, 1927. 936 p. Bibl., p. 887-895.

GUTBIER, A. Fortschritte auf dem Gebiete der analytischen Chemie der Metalloide im Jahre 1924. *Chem.-Ztg.* 49: 753-754, 758-760, 861-864, 869-872, 886-888, 906-908, 925-928 (1925). 219 footnotes.

HEBLER, FELIX. Dispersoidanalyse. *In* Liesegang, Kolloidchem. Tech., p. 164-189 (1927). Bibl. footnotes.

HENDEL, JAMES M. Quantitative analysis. Boston, Ginn, 1925. 137 p. Contains bibliographies.

JAMIESON, GEORGE S. Volumetric iodate methods. N. Y., Chem. Cat. Co., 1926. 96 p. Bibl., p. 91-93.

- KNECHT, E., and HIBBERT, E. New reduction methods in volumetric analysis. 2nd ed. N. Y., Longmans, 1925. 134 p. Bibl., p. 121-126. 100 references.
- KOLTHOFF, IZAAK M., and FURMAN, N. HOWELL. Potentiometric titrations; a theoretical and practical treatise. N. Y., Wiley, 1926. 345 p. Bibl., p. 309-324.
- KÜRSCHNER, K., and SCHARER, K. Ueber die Bestimmung des Nitrations. Chem.-Ztg. 49: 1077-1078 (1925). 44 footnotes.
- LOCKEMANN, GEORG. Aschenanalyse. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 3: 657-844 (1921). Bibl. footnotes.
- MOODY, HERBERT R. Bibliography of the progress in analytical separation of the less common elements, 1907-1909. Seventh Intern. Congr. Appl. Chem. 1: 148-157 (1909).
- MOORE, R. B. Die chemische Analyse seltener technischer Metalle: die Bestimmungsmethoden des Thorium, Cer, Molybdän, Wolfram, Vanadin, Uran, Titan und Zirkon. Leipzig, Akad. Verlagsges., 1927. 295 p. Bibl. at end of each section (German translation of Bur. of Mines Bull. No. 212).
- RAUCH, AUGUST. Fortschritte auf dem Gebiete der analytischen Chemie. 1926. Fortschrittber. Chem.-Ztg., no. 4: 101-112 (1927); 207 footnotes. 1927. *Ibid.*, no. 4: 124-130 (1928); 126 footnotes.
- RHEINBOLDT, H. Capillar- und Adsorptionsanalyse. In Houben-Weyl, Meth. org. Chem. 2nd ed., I: 291-315 (1925). Bibl. footnotes.
- SCHMIDT, HANS. Kapillaranalyse. In Liesegang, Kolloidchem. Tech., p. 190-220 (1927). Bibl. footnotes.
- SCOTT, WILFRED W. Standard methods of chemical analysis; a manual of analytical methods and general reference for the analytical chemist and for the advanced student. 4th ed. N. Y., Van Nostrand, 1925. 2 v. Contains bibliographies.
- SIMONIS, H. Organische Elementaranalyse (mit Ausschluss der Mikroanalyse). In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 1-108 (1925). Bibl. footnotes.
- SONN, A. Massanalyse. In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 211-258 (1925). Bibl. footnotes.
- STINTZING, HUGO. Die Fehlerquellen der quantitativen chemischen Analyse durch Röntgenemissionsspektren. Physik. Z. 27: 852-853 (1926). 35 references.
- WELLS, P. V. The present state of turbidity measurements. Chem. Reviews 3: 377-382 (1927). About 225 references.
- ANALYTICAL CHEMISTRY:** Micro methods.
- DUBSKY, J. V. Organische Mikroelementaranalyse. In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 133-176 (1925). Bibl. footnotes.
- EMICH, F. Methoden der Mikrochemie. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 3: 45-324 (1921). Bibl. footnotes.
- ANAPHYLAXIS**
- LOW, ROBERT C. Anaphylaxis and sensitisation, with special reference to the skin and its diseases. Edinburgh, Green, 1924. 384 p. Bibl., p. 303-380.
- PFEIFFER, HERMANN. Die Arbeitsmethoden bei Versuchen über Anaphylaxie. In Abderhalden, Handb. biol. Arbeitsm. 13, pt. 2: 1-95 (1921). Bibl. footnotes.
- SERENI, ENRICO. L'anafilassi da un punto di vista biologico. Biol. Reviews 3: 119-122 (1928). 170 references.
- ANDALUSITE.*** See ALUMINUM SILICATE.
- ANEMIA**
- EVANS, FRANK A. Pernicious anemia. Baltimore, Williams and Wilkins, 1926. 178 p. 6 p. of bibl.
- See also BLOOD.
- ANESTHETICS**
- BRAUN, HEINRICH. Die örtliche Betäubung, ihre wissenschaftlichen Grundlagen und praktische Anwendung; ein Hand- und Lehrbuch. 7. Aufl. Leipzig, Barth, 1925. 511 p. Literature, p. 467-505.
- HIRSCH, CAESAR. Lehrbuch der Lokalanästhesie des Ohres und der oberen Luft- und Speisewege. Stuttgart, Enke, 1925. 293 p. Literature, p. 264-287.
- KING, JAMES J. Local anesthesia in otolaryngology and rhinology. With supplement on the toxic effects of local anesthetics, containing the complete reports of the various committees of the American Medical Association made to the Therapeutics Research Committee of the Council on Pharmacy and Chemistry, edited by Emil Mayer. N. Y., Hoeber, 1926. 205 p. Bibl., p. 89-93.
- See also ETHER; ETHYL CHLORIDES.
- ANORTHITE.** See ALUMINUM SILICATE.

ANTHELMINTICS

CHOPRA, RAM N., and CHANDLER, ASA C. Anthelmintics and their uses in medical and veterinary practice. Baltimore, Williams & Wilkins, 1928. 291 p. Bibl., p. 254-275.

HALL, MAURICE C., and SHILLINGER, JACOB E. Critical tests of miscellaneous anthelmintics. *J. Agr. Research* 29: 331-332 (1924). 43 references.

HANSON, KARL B. Critical tests of tetrachlorethylene as an anthelmintic for foxes. *J. Agr. Research* 34: 129-136 (1927). Literature, p. 136.

RICHARD, RENÉ A. R. Le tétrachlorure de carbone dans le traitement des affections parasitaires des animaux domestiques. Lyon, Imprimerie Bosc frères & Riou, 1926. 75 p. Bibl., p. 71-73.

ANTHOCYANS

CULPEPPER, CHARLES W., and CALDWELL, JOSEPH S. The behavior of the anthocyan pigments in canning. *J. Agr. Research* 35: 130-132 (1927).

DEKKER, J. Die neueren chemischen Untersuchungen über die Anthozyane. *Pharm. Zentralhalle* 69: 72-73 (1928). 25 references.

GERTZ, OTTO D. Anthocyan als mikrokemisches Reagenz. Lund, Gleerup, 1916. 57 p. (Lunds universitets årsskrift, n. f., avd. 2, bd. 12, nr. 5). Literature, p. 53-57.

ONSLow, MURIEL W. The anthocyanin pigments of plants. 2nd ed. Cambridge, University Press, 1925. 314 p. Bibl., p. 208-299.

See also PIGMENTS: PLANT.

ANTHRACENE

BRUECKNER, H. Die Entwicklung der katalytischen Oxydation von Anthracen zu Anthrachinon. *Chem.-Ztg.* 53: 258 (1929). 17 footnotes.

HOUBEN, J., and FISCHER, W. Das Anthracen und die Anthrachinone mit den zugehörigen vielkernigen Systemen. Leipzig, Thieme, 1929. 890 p. Bibl. footnotes. Also contains references to over 1,300 German patents.

ANTHRAQUINONE

PHILLIPS, MAX. The chemistry of anthraquinone. *Chem. Reviews* 6: 169-174 (1929). 105 references.

ANTI-FREEZE COMPOUNDS *

KEYES, D. B. Antifreeze compounds. *Ind. Eng. Chem.* 19: 1119-1121 (1927). 29 references.

ANTIGENS

BOYER, EDWARD E. H. The chemical nature of the antigenic substances in *Bacillus coli*. Thesis, Ohio State University, 1920. 23 p. Bibl., p. 23.

ANTIKETOGENESIS *

SHAFFER, PHILIP A. Antiketogenesis: its mechanism and significance. *Medicine* 2: 400-404 (1923). 75 references.

ANTI-KNOCK COMPOUNDS *

Antiknock materials. *Ind. Eng. Chem.* 18: 335 (1926). List of 59 substances with journal reference given.

CLARK, G. L., and THEE, W. C. Present status of the facts and theories of detonation. *Ind. Eng. Chem.* 17: 1219-1226 (1925). 61 bibl. footnotes.

ANTIMONATES *

MELLOR, J. W. The antimonates. *In his Inorg. theor. chem.* 9: 461-463 (1929). About 200 references.

ANTIMONIDES *

MELLOR, J. W. The antimonides. *In his Inorg. theor. chem.* 9: 417-420 (1929). About 450 references.

ANTIMONY

HALSE, EDWARD. Antimony ores. London, Murray, 1925. 102 p. 154 references, arranged by country, p. 93-102.

MELLOR, J. W. Antimony. *In his Inorg. theor. chem.* 9: 339-390 (1929). Includes history, 40 references; occurrence, 300 references; extraction, 200 references; allotropic forms, 40 references; physical properties, 600 references; chemical properties, 250 references; atomic weight, 40 references.

WANG, CHUNG YU. Bibliography of antimony, 1917-1924. *J. Assoc. Chinese and American Eng.* 6: 14-34 (1925). 420 references, classified.

ANTIMONY: Organic compounds.

CHRISTIANSEN, WALTER G. O. Organic derivatives of antimony. N. Y., Chem. Cat. Co., 1925. 230 p. Bibl., p. 215-219.

DUNNING, FITZGERALD. Organic compounds of antimony. Thesis, Johns Hopkins University, 1927. 35 p. Bibl., p. 33-34.

ANTIMONY BROMIDE *

MELLOR, J. W. Antimony bromides. *In his Inorg. theor. chem.* 9: 497-498 (1929). 60 references.

ANTIMONY CHLORIDES

MELLOR, J. W. Antimony trichloride. *In his Inorg. theor. chem.* 9: 482-484 (1929). 250 references.

MELLOR, J. W. The higher antimony chlorides. *In his Inorg. theor. chem.* 9: 492-493 (1929). 150 references.

ANTIMONY IODIDES *

MELLOR, J. W. The antimony iodides. *In his Inorg. theor. chem.* 9: 503 (1929). 60 references.

ANTIMONY OXIDES

MELLOR, J. W. Antimonious oxide or antimony trioxide. *In his* Inorg. theor. chem. 9:427-428 (1929). 250 references.

MELLOR, J. W. The antimonious acids and the antimonites. *In his* Inorg. theor. chem. 9:433-434 (1929). 75 references.

MELLOR, J. W. Antimony pentoxide and the antimonics acids. *In his* Inorg. theor. chem. 9:446 (1929). 100 references.

MELLOR, J. W. Antimony tetroxide and the hypoantimonates. *In his* Inorg. theor. chem. 9:438-439 (1929). 150 references.

ANTIMONY SULFIDES

CURRIE, LAUCHLIN M. Antimony sulphides. *J. Phys. Chem.* 30:205-238 (1926). Bibl. footnotes.

MELLOR, J. W. Antimony oxysulphides. *In his* Inorg. theor. chem. 9:579-580 (1929). 80 references.

MELLOR, J. W. Antimony sulphides. *In his* Inorg. theor. chem. 9:528-532 (1929). About 600 references.

MELLOR, J. W. The higher sulphides of antimony. *In his* Inorg. theor. chem. 9:568-569 (1929). About 100 references.

MELLOR, J. W. The sulphoantimonates. *In his* Inorg. theor. chem. 9:576 (1929). About 75 references.

MELLOR, J. W. The sulphoantimonites. *In his* Inorg. theor. chem. 9:556-563 (1929). About 1000 references.

SEEBACH, M. Antimonglanz. *In* Doelter, Handb. Mineralchem. 4, pt. 1:48-61 (1926). 90 footnotes.

ANTISEPTICS

HILL, J. H., and SCOTT, W. W. Mercurochrome-220 as a biliary antiseptic. *Arch. Internal Med.* 35:510-515 (1925).

See also DISINFECTANTS.

APPLES

CALDWELL, JOSEPH S. Chemical composition of American-grown French cider apples and other apples of like character. *J. Agr. Research* 36:406 (1928).

CALDWELL, JOSEPH S. Chemical composition of apple juices as affected by climatic conditions. *J. Agr. Research* 36:364-365 (1928).

CALDWELL, JOSEPH S. Chemical composition of the juices of some American apples. *J. Agr. Research* 36:417 (1928).

CALDWELL, JOSEPH S. Mean summer or "optimum" temperatures in relation to chemical composition in the apple. *J. Agr. Research* 36:388-389 (1928).

CARRÉ, M. H. Chemical studies in the physiology of apples. IV. Investigations on the pectic constituents of apples. *Ann. Bot.* 39:838-839 (1925). 40 references.

CARRICK, DONALD B. The effect of freezing upon the respiration of apples. *Cornell University Agr. Expt. Sta., Memoir* 110:1-28 (1928). 20 references.

DELONG, W. A. Pentosan content in relation to winter hardness in the apple. *Sci. Agr.* 8:521-523 (1928).

HAYNES, D., and ARCHBOLD, H. K. Chemical studies in the physiology of apples; a quantitative study of chemical changes in stored apples. *Ann. Bot.* 42:965-1017 (1928).

NELLER, J. R., and OVERLEY, F. L. Nitrogen and carbohydrate composition of the developing flowers and young fruits of the apple. *Cornell Agr. Expt. Sta., Mem.* 99:52-54 (1926).

ARGINASE *

SABALITSCHKA, TH. Arginase und Urease. *In* Abderhalden, Handb. biol. Arbeitsm. 4, pt. 1:279-314 (1925). Bibl. footnotes.

See also ENZYMES.

ARGON

Argon. *In* Gmelins Handb. anorg. Chem., 8th ed., 1:127-168 (1926). Bibl. through text.

See also AIR; LIQUID; RARE GASES.

ARSENATES *

MELLOR, J. W. The ammonium and alkali arsenates. *In his* Inorg. theor. chem. 9:156-157 (1929). About 150 references.

MELLOR, J. W. The arsenates of the aluminium family of elements. *In his* Inorg. theor. chem. 9:196-197 (1929). About 125 references.

MELLOR, J. W. Arsenates of the antimony-vanadium family. *In his* Inorg. theor. chem. 9:203 (1929). About 50 references.

MELLOR, J. W. The arsenates of the beryllium-mercury family. *In his* Inorg. theor. chem. 9:184-185 (1929). About 125 references.

MELLOR, J. W. The arsenates of the calcium family. *In his* Inorg. theor. chem. 9:174-175 (1929). About 125 references.

MELLOR, J. W. Arsenates of the copper-gold family. *In his* Inorg. theor. chem. 9:164-166 (1929). About 250 references.

MELLOR, J. W. The arsenates of the sulphur-chromium family. *In his* Inorg. theor. chem. 9:216-217 (1929). About 100 references.

ARSENATES *—*Cont'd*

MELLOR, J. W. The arsenates of the manganese and iron families. *In his* Inorg. theor. chem. 9: 232-234 (1929). About 300 references.

ARSENIC

HEIKES, V. C., and LOUGHILIN, G. F. Arsenic. Mineral Resources of the U. S., 1923, pt. 1: 159-181. 37 footnotes.

HURST, MACLEOD E. Arsenic-bearing deposits of Canada. Ottawa, Acland, 1927. 181 p. (Canada, Geological Survey, Economic Geology Series no. 4).

MELLOR, J. W. Arsenic. *In his* Inorg. theor. chem. 9: 1-48 (1929). Includes history, 50 references; occurrence, 500 references; extraction, 60 references; allotropic forms, 50 references; physical properties, 350 references; chemical properties, 200 references; physiological action, 150 references; atomic weight, 50 references.

ARSENIC: Organic compounds.

COLEBROOK, LEONARD. A study of some organic arsenical compounds with a view to their use in certain streptococcal infections. London, H. M. Stationery off., 1928. 40 p. (Medical research council (Gt. Britain). Special report, no. 119). References, p. 40.

CORBITT, HUGH B. Investigations in the 2-phenylbenzothiazole group with special reference to the arsenic derivatives. Thesis, Columbia University, 1925. 35 p. Bibl. p. 34-35.

See also ARSPHENAMINE.

ARSENIC BROMIDES *

MELLOR, J. W. The bromides of arsenic. *In his* Inorg. theor. chem. 9: 249-250 (1929). About 50 references.

ARSENIC CHLORIDES *

MELLOR, J. W. The chlorides of arsenic. *In his* Inorg. theor. chem. 9: 245-247 (1929). About 250 references.

ARSENIC IODIDES *

MELLOR, J. W. The iodides of arsenic. *In his* Inorg. theor. chem. 9: 254-255 (1929). About 75 references.

ARSENIC OXIDES

MELLOR, J. W. Arsenic suboxide and trioxide. *In his* Inorg. theor. chem. 9: 111-116 (1929). About 750 references.

MELLOR, J. W. Arsenic pentoxide; arsenic acid. *In his* Inorg. theor. chem. 9: 147-149 (1929). About 250 references.

RAMBERG, LUDVIG. Arseniksyra och arseniksyrlighets elektrolytiska reduktion till arsenikvate vid katoder av olika metaller. Lund, Gleerup,

1918. 47 p. (Lunds universitets årsskrift. n. f., avd. 2, bd. 14, nr. 21). Literature, p. 46-47.

ARSENIC SULFATES *

MELLOR, J. W. Arsenic sulphates. *In his* Inorg. theor. chem. 9: 335 (1929). About 40 references.

ARSENIC SULFIDES

BIKERMANN, J. J. Ueber Organosole des Arsentrisulfids. Z. physik. Chem. 115: 261-272 (1925). Bibl. footnotes.

MELLOR, J. W. Arsenic trisulphide. *In his* Inorg. theor. chem. 9: 286-289 (1929). About 350 references.

MELLOR, J. W. The complex salts of arsenic trisulphides—the sulpharsenites. *In his* Inorg. theor. chem. 9: 302-305 (1929). About 550 references.

MELLOR, J. W. The complex salts of arsenic pentasulphide—the sulpharsenates. *In his* Inorg. theor. chem. 9: 324-325 (1929). About 100 references.

MELLOR, J. W. The sulphides of arsenic. The disulphide. *In his* Inorg. theor. chem. 9: 270-272 (1929). About 200 references.

MELLOR, J. W. The sulphaarsenides, sulpharsenides or arsenosulphides. *In his* Inorg. theor. chem. 9: 310-313 (1929). About 400 references.

SEEBACH, M. Realgar. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 40-43 (1926). 20 footnotes.

SEEBACH, M. Auripigment. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 43-47 (1926). 28 footnotes.

ARSENIDES *

MELLOR, J. W. The arsenides. *In his* Inorg. theor. chem. 9: 82-90 (1929). About 1000 references.

ARSENITES *

MELLOR, J. W. The arsenites. *In his* Inorg. theor. chem. 9: 134-136 (1929). About 200 references.

MELLOR, J. W. Halogen compounds of the arsenites and arsenates. *In his* Inorg. theor. chem. 9: 263-265 (1929). About 200 references.

ARSINE

MELLOR, J. W. Hydrogen arsenide or arsenic hydride. *In his* Inorg. theor. chem. 9: 59-61 (1929). About 200 references.

ARSPHENAMINE

VOEGTLIN, CARL, and DYER, H. A. Sterilizing efficiency of arspfenamine, neoarsphenamine, and sulpharsphenamine in experimental syphilis. Washington, Govt. print. off., 1927. 11 p. Reprint no. 1136 from the Public health reports 42: 176-186 (1927). References, p. 11.

WEISS, CHARLES, and RAIZISS, GEORGE W. The elimination of arsenic in the urine of syphilitic patients after intravenous injection of arsphenamine. *Arch. Internal Med.* 30: 85-93 (1922). 21 footnotes.

See also ARSENIC: ORGANIC COMPOUNDS.

ASBESTOS

BECKER & HAAG. Asbest, seine Fundstellen, Gewinnung, Aufbereitung, Verarbeitung und Anwendung in Industrie und Technik. Berlin, 1927. 98 p. Literature, p. 98-99.

BOWLES, OLIVER. Asbestos. *Mineral Ind.* 35: 74 (1926); 36: 40 (1927). 15 references.

BOWLES, OLIVER, and STODDARD, B. H. Asbestos in 1927. *Mineral Resources of the U. S.*, 1927, II: 310-311. 17 references.

LADOO, R. B. Asbestos. In *his* Non-metallic minerals, 43-66 (1925). Bibl. footnotes. Bibl., p. 65-66. 28 references.

ASPHALT

SPIELMANN, PERCY E. Bituminous substances; scientific progress of practical importance during the last fifteen years. London, Benn, 1925. 206 p. Bibl., p. 194-199.

See also BITUMENS.

ASSAYING*

FAIRBANKS, ERNEST E. The laboratory investigation of ores; a symposium. N. Y., McGraw-Hill, 1928. 262 p. Contains bibliographies.

ATMOSPHERE

FRIEND, J. N., and TWISS, D. F. Atmosphere. In Friend, Textbook of inorg. chem. VII, pt. 1: 156-204 (1924). Bibl. footnotes.

MELLOR, J. W. The composition of the atmosphere. In *his* Inorg. theor. chem. 8: 15-22 (1928).

See also AIR.

ATOMIC STRUCTURE

BRILLOUIN, LÉON. La nouvelle mécanique atomique. *J. phys. radium* 7: 135-160 (1926). Bibl. footnotes.

FAJANS, K. Die Eigenschaften salzartiger Verbindungen und Atombau. *Z. Kryst.* 61: 47-48 (1925). About 50 references.

GERLACH, WALTHER. Magnetismus und Atombau. *Ergeb. exakt. Naturwissenschaften* 2: 145-146 (1923). 41 references.

LUNNON, R. G. Atomic dimensions. *Proc. Phys. Soc. London* 38: 106-107 (1926). 64 references.

NOYES, ARTHUR A., and BECKMAN, ARNOLD O. The structure of atoms as a periodic property and its relation to

valence and ion-formation. *Chem. Reviews* 5: 107 (1928). 29 references.

SMITH, J. D. MAIN. Chemistry and atomic structure. London, Benn, 1924. 221 p. Bibl., p. 207-209.

STONER, EDMUND C. Magnetism and atomic structure. Dutton, 1926. References at end of each chapter. Recent references, p. 357-359.

See also ELECTRONICS; VALENCE.

ATOMIC THEORY

ANDRADE, EDWARD NEVILLE DA COSTA. What is the atom? N. Y., Harper, 1927. 78 p. Bibl., p. 77-78.

BAVINK, BERNHARD. Grundriss der neueren Atomistik. Mit einem Anhang: Elementare Ableitung einiger wichtiger mathematischer Formulierungen. Leipzig, Hirzel, 1922. 130 p. Bibl., p. iv, 129-130, and in footnotes.

CLARK, CECIL H. D. The basis of modern atomic theory. London, Methuen, 1926. 292 p. References at end of each chapter. Bibl., p. 281-282.

GERLACH, WALTHER. Materie, Elektrizität, Energie; die Entwicklung der Atomistik in den letzten zehn Jahren. Dresden und Leipzig, Steinkopff, 1923. 195 p. Bibl. footnotes.

See also MOLECULAR THEORY.

ATOPHAN

JENSEN, MARTIN. Versuche mit Atophanyl. Hamburg, Christians Druckerei und Verlag, 1925. 43 p. Literature, p. 42-43.

AUTOLYSIS. See METABOLISM (Lip-schitz).

AZO COMPOUNDS.* See DIAZO COMPOUNDS.

AZOXY COMPOUNDS.* See DIAZO COMPOUNDS.

BACTERIA

BAAS-BECKING, L. M. G., and PARKS, G. S. Energy relations in the metabolism of autotrophic bacteria. *Physiol. Rev.* 7: 104-106 (1927).

BIDZINSKI, SIGISMOND. Contribution à l'étude de l'action bactéricide des sels de cuivre. Nancy, Société d'impressions typographiques, 1926. 96 p. Bibl., 85-93.

BUCHANAN, R. E., and FULMER, ELLIS I. Physiology and biochemistry of bacteria. Vol I. Growth phases, composition and biophysical chemistry of bacteria and their environment; Energetics. Baltimore, Williams and Wilkins, 1928. 516 p. Bibl., p. 463-493.

FALK, I. S. The colloidal behavior of bacteria. In Alexander, Colloid chemistry II: 543-555 (1928). 30 footnotes.

BACTERIA—Cont'd

FALK, I. S. Electrophoresis of bacteria and other microorganisms and some relations to immunological theory. In Alexander, Colloid chemistry II: 744-746 (1928).

HALVERSON, WILLIAM V. Nitrogen metabolism of nitrogen-fixing bacteria. Iowa State College J. Sci. I: 395-410 (1927). References, p. 409-410.

JORDAN, EDWIN O., and FALK, I. S. The newer knowledge of bacteriology and immunology, by eighty-two contributors. Chicago, University of Chicago Press, 1928. 1196 p. Bibl. at end of some of the chapters.

KOPELOFF, NICHOLAS. *Lactobacillus acidophilus*. Baltimore, Williams and Wilkins, 1926. 211 p. Bibl., p. 184-193.

LÖHNIS, F. Fortschritte der landwirtschaftlichen Bakteriologie. Z. Gärungsphysiol. 1: 68-88, 340-370 (1912); 2: 159-166 (1913); 4: 49-57 (1915); 5: 32-39, 216-222, 300-306 (1916). Covers 1910-1914.

MUIR, ROBERT, and RITCHIE, JAMES. Manual of bacteriology. Revised with the cooperation of H. Browning and Thomas J. Mackie. 8th ed. London, Oxford Univ. Press, 1927. 821 p. Bibl., p. 761-804.

PAPACOSTAS, GEORGES, and GATÉ, JEAN. Les associations microbiennes; leurs applications thérapeutiques. Paris, Doin, 1928. 438 p. Bibl., p. 365-406.

ROBERTSON, A. H. Thermophilic and thermoduric microorganisms, with special reference to species isolated from milk. II. The thermal resistance of microorganisms. Vt. Agr. Expt. Sta., Bull. 274 (1927). Bibl., p. 22-27. 157 references.

ROBERTSON, A. H. Thermophilic and thermoduric microorganisms with special reference to species isolated from milk. Review of the literature. N. Y. State Agr. Expt. Sta., Bull. 130: 21-56 (1927).

ROSSI, GINO DE. Microbiologia agraria e tecnica ad uso degli studene degli agricoltori e degli industriali. Torino, Unione tipo grafico-editrice torinese, 1927. 1410 p. Bibl., p. 1197-1287.

SALLE, A. J. Differentiation of the coli and aerogenes group of bacteria. J. Am. Water Works Assoc. 21: 76-78 (1929). 61 references.

SHAUGHNESSY, HOWARD J., and WINSLOW, G. E. A. The diffusion products of bacterial cells as influenced by the presence of various electrolytes. J. Bact. 14: 97-99 (1927).

STEARNS, ALLEN E., and STEARNS, ESTER W. Studies in the physico-chemical behavior of bacteria. University of Missouri studies 3: no. 2 (1928). 84 p. Bibl., p. 75-84. 144 references.

TANNER, FRED WILBUR. Bacteriology, a text-book of microorganisms. N. Y., Wiley, 1928. 548 p. Bibl., p. 505-508; references at end of each chapter.

VALENTI, EGRIDIO. Ricerche fisico chimica di costituenti specifici nella compagine bacillare. Biochimica sperimentale 14: 114-115 (1927). 32 footnotes.

WINSLOW, CHARLES E. A., and DOLLOFF, A. F. Relative importance of additive and antagonistic effects of cations upon bacterial viability. J. Bact. 15: 90-92 (1928).

ZINSSER, HANS. A textbook of bacteriology; a treatise on the application of bacteriology and immunology to the etiology, diagnosis, specific therapy and prevention of infectious diseases for students and practitioners of medicine and public health. 6th ed. N. Y., Appleton, 1928. 1053 p. Bibl. footnotes.

BACTERIOPHAGE *

HÉRELLE, F. Le bactériophage et son comportement. 2 éd., Paris, Masson, 1926. 551 p. Bibl., p. 515-532. English translation by G. H. Smith. Baltimore, Williams and Wilkins, 1926. Bibl., p. 579-608.

BAKELITE. See PLASTICS: SYNTHETIC.**BAKING ***

FOUASSIER, PAUL. Pour le boulanger et le pâtissier; initiations scientifiques, recettes, formules, procédés, tours de main et "trucs" de boulangerie, biscuiterie, pâtisserie. Paris, Dunod, 1928. 231 p. Bibl., p. 88-92.

GERHARD, ALBERT F. Handbook for bakers. N. Y., Century, 1925. 484 p. Bibl., p. ix.

PHILLIPS, CAROLINE L., and SHOLLENBERGER, J. H. Flour milling and bread making; a selected list of references. Rev. June 1925. Washington, 1925. U. S. Dept. of Agriculture. Bureau of Agricultural Economics. Agricultural Economics Bibliography no. 2. 24 p. Mimeographed.

BALATA. See GUMS.**BANANA**

BOONE, RAY C. P. Le bananier; culture—industrie—commerce. Paris, Société d'éditions géographiques, maritimes et coloniales, 1926. 346 p. Bibl., p. 323-329.

FAWCETT, WILLIAM. The banana, its cultivation, distribution and commercial uses. 2nd ed. London, Duckworth and Co., 1921. 299 p. Bibl. footnotes.

REYNOLDS, PHILIP KEEP. The banana; its history, cultivation and place among staple foods. Boston, Houghton Mifflin, 1927. 181 p. Bibl., p. 159-172.

SKINNER, SHERMAN and ESSELEN, INC. The food value of the banana. 2nd ed. Boston, Leonard, 1926. 24 p. References, p. 24.

BARIUM

BURR, MAY S. Barium and its compounds. In Friend, Textbook inorg. chem. III, pt. I: 196-265 (1925). Bibl. footnotes.

GUNTZ, A. Sur la préparation du baryum. Chimie et industrie, special number, Feb., 1929: 462. 47 references.

BARIUM ARSENATES. See ARSENATES.

BARIUM CHLORIDE

SCHAUB, —. Baryumchlorid. In Ullmann's Enzyk. tech. Chem., 2nd ed., 2: 106-109 (1928). Covers manufacturing patents.

BARIUM SILICATES.* See SILICATES.

BARIUM SILICIDES.* See SILICIDES.

BAUXITE

FOX, CYRIL S. Bauxite; a treatise discussing in detail the origin, constitution, known occurrences and commercial uses of bauxite and including particulars regarding the present condition of the aluminium industry and the peculiar importance of cryolite in the extraction of aluminium from bauxite. Lockwood, 1927. Bibl., p. 270-304.

KNIBBS, N. V. S. Industrial uses of bauxite. London, Benn, 1928. 141 p. Bibls. at end of chapters.

See also ALUMINUM.

BEER

HOLM, JUST. CHR. Die Krankheiten des Bieres und deren Bekämpfung. Z. Gärungsphysiol. 1: 320-339 (1912). About 100 references.

KUHN, ERNST. Beitrag zur Geschichte des Bieres. Z. techn. Biologie 8: 194-216 (1921). Bibl. footnotes.

See also BEVERAGES; BREWING.

BELLADONNA

ROTHLIN, E. Zur Methodik des pharmakologischen Nachweises von Belladonnaalkaloiden. Arch. ges. Physiol. 206: 614-628 (1924). Bibl. footnotes.

See also ALKALOIDS.

BENTONITE

DAVIS, C. W., and VACHER, H. C. Bentonite, its properties, mining, preparation and utilization. U. S. Bur. Mines, Tech. Paper No. 438. 1928. 51 p. 105 footnotes.

BENZENE

ARDAGH, E. G. R., and FURBER, C. M. Removal of thiophen from benzene and a new method for the preparation of thiophen-free benzene on a laboratory scale. J. Soc. Chem. Ind. 48: 75-76 (1929). 48 references.

GREENBURG, LEONARD. Benzol poisoning as an industrial hazard. Review of studies conducted in cooperation with the subcommittee on benzol of the Committee on industrial poisoning of the National Safety Council. Washington, Govt. print. off., 1926. 63 p. Reprint no. 1096 from the Public Health Reports 41: 1357-1375, 1410-1431, 1516-1539 (1926). Bibl., p. 59-63.

NATIONAL BENZOL ASSOCIATION. Second report of the joint Benzol Research Committee of the National Benzol Association and the University of Leeds. Presented March 18, 1925. London. Bibl., 1923, p. 226-232. Sources, 7; recovery, 33; refining, 30; analysis, 11; properties, 18; uses, 3; gas purification, 4 (106 references). Bibl., 1924, p. 233-. Sources, 20; recovery, 57; manufacture of active carbon, 20; manufacture of gels, 9; refining, 38; analysis, 22; properties, 16; uses, gas purification, 16 (209 references).

NATIONAL SAFETY COUNCIL. Committee of chemical and rubber sections. Final report on benzol. 1926. Bibl. on health hazards of benzol, p. 123-128. 146 references.

BENZOTHAZOLE

STULL, ARTHUR. Preparation of new benzothiazoles. Acid anhydride and acid chloride derivatives of di-*o*-aminophenyl disulfide. Thesis, Columbia University, 1925. 28 p. Bibl., p. 27-28.

BENZYL COMPOUNDS

JENSEN, H. H. Experimental study of certain benzyl compounds with especial attention to the importance of substitution in the benzyl nucleus and the significance of the side chains. J. Pharmacol, 26: 167-169 (1925). 56 references.

KAUFMANN, H. P. Darstellung von Benzylverbindungen. Arch. Pharm. 267: 212-229 (1929). 59 bibl. footnotes.

BERBERINE

- SCHULTZ, E. R. Berberine in the common barberry (*Berberis vulgaris* L.) J. Am. Pharm. Assoc. 15: 37-39 (1926). 64 references.

BERYL.* See BERYLLIUM SILICATES.**BERYLLIUM**

- GREGORY, JOSHUA C., and BURR, MAY SYBIL. Beryllium and its congeners. London, Griffin, 1926. 342 p. (Friend, Textbook of inorg. chem. III, pt. 2.)

BERYLLIUM ARSENATES. See ARSENATES.**BERYLLIUM SILICATES**

- MELLOR, J. W. Beryllium aluminium silicates. In *his* Inorg. theor. chem. 6: 806-808 (1925). About 150 references.

- MELLOR, J. W. Beryllium or glucinium silicates. In *his* Inorg. theor. chem. 6: 383-384 (1925). About 100 references.

See also SILICATES.

BEVERAGES

- DONALD, J. R., JONES, C. L., and MACLEAN, A. R. M. The effect of carbonation on bacteria in beverages. J. Am. Public Health Assoc. 14: 128 (1924). 28 references.

- JACOBSEN, EDUARD. Handbuch für die Getränke-Industrie, Getränke-Fabriken und den Getränke-Grossbetrieb. Berlin, Parey, 1925. 1251 p. Bibl., p. 1214-1216.

See also BEER; CACAO; COFFEE; TEA; WINE; etc.

BILE

- BRAKEFIELD, JAMES L., and SCHMIDT, CARL L. A. Studies in the synthesis and elimination of certain bile components in obstructive jaundice. J. Biol. Chem. 67: 544-545 (1926).

- MURPHY, WILLIAM P. Biliary system function tests. Arch. Internal Med. 37: 797-814 (1926). 42 footnotes.

- SCHMIDT, CARL L. A. The extra-hepatic functions of bile. Physiol. Rev. 7: 142-150 (1927).

BILE ACIDS

- ALDRICH, MARTHA, and BLEDSOE, MARY SUE. Studies in the metabolism of the bile. I. A quantitative Pettenkofer test applicable to the determination of bile acids in blood. J. Biol. Chem. 77: 535-537 (1928). 44 references.

BILE PIGMENTS

- ASCHOFF, L. Ueber den Ort der Gallenfarbstoffbildung. Klin. Wochschr. 3: 967 (1924). 31 references.

- BOCK, ERICH. Zum Problem der Gallenfarbstoffbildung und des Ikterus. Klin. Wochschr. 3: 641 (1924). 51 references.

- RICH, ARNOLD R. The formation of bile pigments. Physiol. Rev. 5: 219-224 (1925). 120 references.

BILIRUBIN

- MANN, FRANK C. The extrahepatic formation of bilirubin. Ergeb. Physiol. 24: 379-308 (1925). 50 references.

BIOCHEMISTRY

- Biochemistry. Jahresbericht über die gesamte Physiologie und experimentelle Pharmakologie mit vollständiger Bibliographie 1: 319-926 (1920); 2: 1-696 (1921); 3: 561-1311 (1925); 4: 1-810 (1923); 5: 779-1735 (1926).

- Données biologiques. In Tables annuelles V: 1537-1591 (1917-1922); VI: 1354-1399 (1923-1926).

- JUNK, W. Tabulae Biologicae. Berlin, Junk, 1925-1927. 4 vols. Bibls. through text.

- MACLEOD, J. J. R. Physiology and biochemistry in modern medicine. 5th ed. St. Louis, Mosby, 1926. 1054 p. Bibl. at end of each part.

- MORSE, WITHROW. Applied biochemistry. 2nd ed. Philadelphia, Saunders, 1927. 988 p. "Suggested readings" at end of each chapter except the last.

- Physiologie et chimie végétales. In Tables annuelles V: 1592-1659 (1917-1922); VI: 1400-1442 (1923-1926).

- OLONOVSKI, MICHEL. La synthèse organique dans le monde végétal. Bull. soc. chim. biol. 7: 580-589 (1925). 182 references.

- PRYDE, JOHN. Recent advances in biochemistry. London, Churchill, 1926. 348 p. References at the end of each chapter.

- SPIRO, K. Einige Ergebnisse über Vorkommen und Wirkung der weniger verbreiteten Elemente. Ergeb. Physiol. 24: 474-477 (1925). 228 references.

- WURMSER, RENÉ. L'énergétique et la biochimie. Bull. soc. chim. biol. 5: 527-528 (1923). 25 references.

BIOS

- FULMER, ELLIS I. Bios. A résumé. Proc. Iowa Acad. Sci. 31: 95-96 (1924). 31 references.

BISMUTH

- ALLEN, ROBERT. Bismuth ores. London, Murray, 1925. 62 p. Bibl., p. 57-62. 80 references.

- MELLOR, J. W. Bismuth. In *his* Inorg. theor. chem. 9: 587-634 (1929). Includes history, 40 references; occurrence, 150 references; extraction, 125 references; physical properties, 1000 references; chemical properties, 200 references; atomic weight, 75 references.

Wismut und radioaktive Isotope. Gmelin's Handb. anorg. Chem., 8. Aufl. System Nummer 19. 1927. 229 p.

BISMUTH: Alloys.*

MELLOR, J. W. The bismuthides. *In his* Inorg. theor. chem. 9: 641-643 (1929). About 250 references.

BISMUTH ARSENATES. See ARSENATES.

BISMUTH BROMIDES *

MELLOR, J. W. The bismuth bromides. *In his* Inorg. theor. chem. 9: 673-674 (1929). About 50 references.

BISMUTH CARBONATES

MELLOR, J. W. The bismuth carbonates. *In his* Inorg. theor. chem. 9: 704-705 (1929). About 40 references.

BISMUTH CHLORIDES

MELLOR, J. W. The bismuth chlorides. *In his* Inorg. theor. chem. 9: 668-670 (1929). About 150 references.

BISMUTH IODIDES *

MELLOR, J. W. The bismuth iodides. *In his* Inorg. theor. chem. 9: 678 (1929). About 50 references.

BISMUTH NITRATES

MELLOR, J. W. The bismuth nitrates. *In his* Inorg. theor. chem. 9: 710-711 (1929). About 150 references.

BISMUTH OXIDES *

MELLOR, J. W. Bismuth monoxide and trioxide. *In his* Inorg. theor. chem. 9: 651-653 (1929). About 175 references.

MELLOR, J. W. The higher oxides of bismuth. *In his* Inorg. theor. chem. 9: 658-659 (1929). About 75 references.

BISMUTH SULFATES

MELLOR, J. W. Bismuth sulphates and oxysulphides. *In his* Inorg. theor. chem. 9: 701-702 (1929). About 50 references.

BISMUTH SULFIDES

MELLOR, J. W. The bismuth sulphides. *In his* Inorg. theor. chem. 9: 687-689 (1929). About 175 references.

MELLOR, J. W. Complex bismuth sulphides; sulphobismuthites. *In his* Inorg. theor. chem. 9: 696-698 (1929). About 300 references.

SEEBACH, M. Wismutglanz. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 61-66 (1926). 30 footnotes.

BITTER PRINCIPLES

BETH, WILHELM. Die Bitterstoffe. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 11: 71-168 (1926). Bibl. footnotes.

MESSMER, J. Bitterstoffe. *In* Wiesner, Rohstoffe des Pflanzenreiches 1: 175-189 (1927). 874 references.

See also DRUGS.

BITUMENS

SPIELMANN, PERCY E. Bituminous substances. Scientific progress of practical importance during the last fifteen years. London, Benn, 1925. 221 p. Bibl., p. 194-199. 200 references with name index.

See also ASPHALT.

BLAST FURNACE

PAVLOV, MIKHAIL ALEKSANDROVICH. Abmessungen von Hoch- und Martinöfen. Leipzig, Spamer, 1928. 148 p. Bibl. footnotes.

See also CARBON (Falore); IRON AND STEEL; METALLURGY.

BLEACHING

SCHULTZ, J. Farbstofftabellen. 6th ed. Berlin, Wiedmann, 1923. Bibl., p. 281-282.

SOCIETY OF CHEMICAL INDUSTRY. Bleaching, dyeing, printing and finishing. *In* Reports on progress of applied chemistry 10: 165-187 (1925); 203 footnotes. 11: 144-166 (1926); 219 footnotes. 12: 144-169 (1927); 242 footnotes. 13: 157-179 (1928); 97 footnotes.

See also PAPER.

BLOOD

ALBERTI, FRIEDRICH HERMANN. Schwankungen des chemisch-physikalischen Blutbildes beim Rinde (zugleich ein Beitrag zur Konstitutionsforschung). Inaug.-Diss., Leipzig, 1927. 84 p. Bibl., p. 83-84.

AUGSBERGER, A. Ultrafiltration und Kompensationsdialyse. Ein Beitrag zur Frage der Ionenbindung im Blutserum. *Ergeb. Physiol.* 24: 618 (1925). 39 references.

AUSTIN, JAMES H., and CULLEN, GLENN E. Hydrogen ion concentration of the blood in health and disease. Baltimore, Williams and Wilkins, 1926. 75 p. References, p. 63-72. Also in *Medicine* 4: 336-343 (1925).

BOS, WILLEM P. C. Het optisch draaiingsvermogen van urine en bloed van dieren. Utrecht, Drukkerij "Laurens Coster," Fa. Schotanus & Jens, 1923. 68 p. Proefschrift—Veeartsenijk, Hoogeschool. Utrecht. Bibl., p. 3.

BREY, MAX. Ueber die Wasserstoffionenkonzentration des Pferdeblutes. Hannover, Schaper, 1926. 86 p. Bibl., p. 77-86.

BUCKMAN, THOMAS E. Review of the recent literature on the blood. *Am. J. Diseases Children* 29: 221-251 (1925). 203 footnotes.

DEVULDER, ETIENNE. La sedimentation spontanée du sang chez les animaux domestique. Thèse, Univ. de Lyon, 1925. 84 p. Bibl., p. 81-84.

BLOOD—Cont'd

- DE WESSELOW, OWEN L. V. S. The chemistry of the blood in clinical medicine. London, Benn, 1924. 255 p. References at end of each chapter, except the last.
- FEINBLATT, HENRY M. Uricacidemia based on a study of 1,500 blood chemical analyses. Arch. Internal Med. 31: 758-765 (1923). 16 bibl. footnotes.
- GALLOT, —. Étude sur le pH du serum de cheval. Paris, Le François, 1927. 86 p. Bibl., p. 84-86.
- GRADWOHL, RUTHERFORD B. H., and GRADWOHL, IDA E. Blood and urine chemistry. St. Louis, Mosby, 1928. 542 p. Bibl. at end of chapter 16, and bibl. footnotes.
- HILL, LEWIS W. Review of the literature on the blood and blood diseases of infants and children for the last four years (1918-1921). Am. J. Diseases Children 25: 168-184 (1923). 43 footnotes.
- HILLER, ALMA, LINDER, C. C., and VAN SLYKE, D. D. The reducing substances of the blood. J. Biol. Chem. 64: 637-638 (1925). 38 references.
- KANITZ, ARISTIDES. Chemie der isolierten Zellen; Blutkörper, Spermatozoen. In Oppenheimer, Handb. Biochem. 2: 560-588 (Blood), 586-594 (Spermatozoa). 280 footnotes.
- KILDUFFE, ROBERT A. The clinical interpretation of blood chemistry. Philadelphia, Lea & Febiger, 1927. 186 p. References at end of most of the chapters.
- KNOLL, ULRICH. Ueber einen Beitrag zum Blutbild des gesunden Pferdes, unter Berücksichtigung der gesamten einschlägigen Literatur. Inaug.-Diss., Giessen, 1924. 24 p. Bibl. p. 21-23.
- MUTKOWSKI, R. A. Studies on the blood of insects. Bull. Brooklyn Ent. Soc. 18: 135-136 (1923); 19: 17-19 (1924).
- PICKERING, JOHN W., and HEWITT, JAMES A. The action of peptone and of nucleic acids on the coagulability of the blood. Proc. Roy. Soc. 96B: 93-94 (1924). 36 references.
- RIEGER, JOHN B., and FREUND, HUGO A. The alkalimetry of whole blood. II. The acid fixing power of the blood in renal disease. Arch. Internal Med. 30: 517-530 (1922). 38 footnotes.
- SCHITTENHELM, ALFRED. Handbuch der Krankheiten des Blutes und der blutbildenden Organe. Haemophilie, Haemoglobinurie, Haematoporphyrie. Berlin, Springer, 1925. 2 v. Contains bibliographies.
- WELSH, W. Das Blut der Haustiere mit neueren Methoden untersucht. V. Untersuchungen des Schweine-, Schaf- und Ziegenblutes. Arch. ges. Physiol. 198: 37-55 (1923). Bibl. footnotes.
- BLOOD: Analysis.**
- FONTÈS, GEORGES, and THIVOLLE, LUCIEN. Recherches expérimentales sur le microdosage des substances glucidiques réductrices du sang. Bull. soc. chim. biol. 9: 442-445 (1927). 57 references.
- GRAY, HORACE. Blood sugar standards. I. Normal and diabetic persons. Arch. Internal Med. 31: 241-258 (1923). 47 footnotes.
- STONE, WILLARD J. Blood chemistry colorimetric methods for the general practitioner, with clinical comments and dietary suggestions. 2nd ed. rev. N. Y., Hoeber, 1926. 129 p. References at end of most of the chapters.
- WEHDING, LUDWIG. Vergleichende Untersuchungen über Zahl, Grösse und Hämoglobingehalt, sowie verschiedene andere Eigenschaften der roten Blutkörperchen des Kaninchens. Inaug.-Diss., Tierarztl. Hochschule, Hannover. 1926. 38 p. Bibl., p. 35-38.
- BLOOD: Cholesterol.** See CHOLESTEROL.
- BLOOD EQUILIBRIUM**
- AUGUSTE, C. Équilibre osmotique de l'urée dans le sang et la liquide céphalo-rachidien. Lille, 1922. 143 p. Bibl., p. 135-140.
- HENDERSON, YANDELL. Physiological regulation of the acid-base balance of the blood and some related functions. Physiol. Rev. 5: 157-160 (1925). 54 references.
- KOEHLER, ALFRED E. Acid-base equilibrium. I. Clinical studies in alkalosis. Arch. Internal Med. 31: 590-605 (1923). 28 bibl. footnotes.
- BLOOD POISONS ***
- LIPSCHITZ, WERNER. Ueber den Wirkungsmechanismus von Blutgiften. Ergeb. Physiol. 23, 1: 1-3 (1924). 84 references.
- BLOOD SUGAR**
- GIGON, ALFRED. Die Kohlenhydrate des Blutes und ihre Verarbeitung im Organismus. Ergeb. Physiol. 24: 196-197 (1925). 35 references.
- RIGLER, L. G., and ULRICH, H. L. Blood sugar reaction following intravenous injection of glucose. Arch. Internal Med. 32: 343-352 (1923). 35 footnotes.
- SOMOGYI, MICHAEL. Reducing non-sugars and true sugar in human blood. J. Biol. Chem. 75: 43 (1927). 28 references.

STAMMERS, ARTHUR D. Blood sugar and diabetes. *Physiol. Rev.* 6: 675-682 (1926).

See also DIABETES.

BOILER PLATES*

PARR, SAMUEL W., and STRAUB, FREDERICK G. Embrittlement of boiler plate. University of Illinois. Eng. Expt. Sta. Bull. no. 177. 71 p. Bibl., p. 58-63.

BOILING POINT

HANSEN, CHRISTIAN J. Bestimmung des Siedepunktes (seine Bedeutung und Beziehungen). In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 826-865 (1925). Bibl. footnotes.

KEYES, D. B., MASON, D. B., and TAYLOR, ROGER K. Variation of boiling point with composition, for liquid mixtures of volatile components. International critical tables III: 324 (1928). 51 references.

SAXTON, BLAIR. Boiling point elevations, non-volatile solutes. International critical tables III: 349-350 (1928). 271 references.

See also VAPOR PRESSURE.

BONES

SHEAR, M. J., and KRAMER, BENJAMIN. Composition of bone. III. Physico-chemical mechanism. *J. Biol. Chem.* 79: 143-145 (1928). 61 references.

See also MARROW.

BORAX

LADOO, R. B. Borax and the borates. In his Non-metallic minerals, 110-111 (1925).

U. S. LIBRARY OF CONGRESS. List of references on borax. 10 p. (Type-written). 1925.

BORDEAUX MIXTURE

HOLLAND, EDWARD B., DUNBAR, C. O., and GILLIGAN, G. M. Influence of form and proportion of lime used and of method of mixing on the resulting Bordeaux mixture. *J. Agr. Research* 34: 685-686 (1927).

See also INSECTICIDES.

BORON

Bor. Gmelin's Handb. anorg. Chem., 8 Aufl., no. 13. Leipzig, Verlag Chemie, 1926. 142 p. Literature through 1925.

KAHLENBERG, HERMAN H. Boron and boron suboxide. *Trans. Am. Electrochem. Soc.* 47: 23-55 (1925). 27 footnotes.

BOROSILICATES*

MELLOR, J. W. The borosilicates. In his Inorg. theor. chem. 6: 451-453 (1923). About 250 references.

BOTANICAL CHEMISTRY

HAAS, PAUL, and HILL, T. G. An introduction to the chemistry of plant

products. 4th ed. London, Longmans, 1928. Includes bibliographies.

LLOYD, FRANCIS E. Colloidal aspects of botany. In Alexander, Colloid chemistry II: 616-618 (1928).

PALLADIN, VLADIMIR IVANOVICH. Palladin's plant physiology. Authorized ed. in English, based on the German translation of the 6th Russian ed. and on the 7th Russian ed. (1914) of the Text-book of plant physiology. 3rd American ed. Philadelphia, Blakiston's 1926. 360 p. A classified list of books for reference in plant physiology, p. 19-25.

WIESNER, JULIUS v. Die Rohstoffe des Pflanzenreiches. 3 vols. Leipzig, Engelmann, 1914-1921. Bibl. footnotes. 4th ed., 1927-1928. 2 v. Contains bibliographies.

BRASS

BAUER, O., and HANSEN, M. Der Aufbau der Kupferzink Legierungen. Mitt. Materialprüfungsamt, Special no. 4: 141-146 (1927). 156 references.

CLARK, FRANCES H. Study of the 470° C. transition point in cast 60:40 brass. *Proc. Inst. Metals Div., Am. Inst. Mining Met. Eng.* 1927: 268-270. 48 references.

ELLIS, O. W. High-strength brasses. *Am. Inst. Mining Met. Eng., Tech. Publ., No. 167.* 1929. Bibl., p. 23-25. 48 references.

HAMILTON, H. English brass and copper industries to 1800. N. Y., Longmans, 1926. 388 p. Bibl., p. 369-373. See also COPPER; ALLOYS.

BREWING

CUNIASSE, L. Mémorial du distillateur liquoriste, contenant les renseignements actuels sur la fabrication des liqueurs suivi d'un formulaire et des lois et règlements qui intéressent la profession. Paris, Librairie de François, 1925. 299 p. Bibl., p. 293-294.

EMSLANDER, FRITZ. Bierbrauerei und Kolloidchemie. In Liesegang, Kolloidchem. Tech.. 816-829 (1927). Bibl. footnotes.

See also FERMENTATION.

BRONZE

STRAUSS, JEROME. Aluminium bronze. *Trans. Am. Soc. Steel Treating* 12: 260-273 (1927). 343 references.

See also ALLOYS.

BUILDING STONE

DIENEMANN, WILHELM, and BURRE, O. Die nutzbaren Gesteine Deutschlands und ihre Lagerstätten mit Ausnahme der Kohlen, Erze und Salze. Stuttgart, Enke, 1928. Bibl. references.

BUILDING STONE—Cont'd

GREAT BRITAIN. *Dept. of Scientific and Industrial Research*. Building Research Board. Report of the Stone Preservation Committee. London, H. M. Stationery off., 1927. 33 p. Bibliography of some of the literature on the decay and preservation of stone, p. 31-33.

GRENGG, ROMAN. Ueber die Bewertung von natürlichen Gesteinen für bautechnische Zwecke. Halle, Knapp, 1928. 64 p. Bibl. footnotes.

KESSLER, D. W. Building stones. International critical tables II: 56 (1927). 49 references.

BUTTER

CLAYTON, WM. Die Beziehungen der Kolloidchemie zur Butter- und Margarinefabrikation. In *Liesegang, Kolloidchem. Tech.* 449-458 (1927). Bibl. footnotes.

HUNZIKER, OTTO F. The butter industry, prepared for factory, school and laboratory. 2nd ed., completely rewritten. LaGrange, Ill., The author, 1927. 682 p. References, p. 593-602. See also DAIRY PRODUCTS; MARGARINE; MILK.

CABBAGE *

PETERSON, WILLIAM H., and PETERSON, CLARA B. The water-soluble content of calcium and phosphorus in cabbage. *J. Agr. Research* 33: 699 (1926).

CACAO

MACLAREN, W. A. Rubber, tea and cacao. London, Benn, 1924. 334 p. Bibl., p. 323-326.

PLÜCKER, W., STEINRUCK, AD., and STARCK, FR. Untersuchungen über Kakao. I. Nachweis von Schalen. *Z. Nahr. Genussm.* 50: 307-315 (1925).

WALTON, GEORGE P., and GARDINER, R. F. Cocoa by-products and their utilization as fertilizer materials. U. S. Dept. of Agriculture. Department Bull. no. 1413. 44 p. Bibl., p. 41-44.

WILLIAMS, EDITH C. A bibliography of the nutritive value of chocolate and cocoa. Hershey, Pa., Hershey Chocolate Co., 1925. 64 p. An annotated bibl. of 166 references.

ZELLER, TRAUOGOT. Kakao. Hamburg, Bangert, 1925. 165 p. Literatur, p. 164-165.

ZIPPERER, PAUL. Die Schokoladen-Fabrikation; eine Monographie der Kakaofrucht und ihrer Verwertung. Berlin, Krayn, 1924. 338 p.

CADMIUM

Cadmium. *Gmelin's Handb. anorg. Chem.*, 8th ed. System-Nummer 33. Leipzig, Verlag Chemie, 1925. 214 p.

Bibl. through text. Covers the metal and its compounds, through June, 1924.

GREGORY, J. C., and BURR, M. S. Cadmium and its compounds. In *Friend, Textbook inorg. chem.* III, pt. II: 159-200 (1926). Bibl. footnotes.

SIEBENTHAL, C. E., and STALL, A. Cadmium. *Mineral Resources of the U. S.*, 1924, pt. I: 10-11.

TYLER, PAUL M. Cadmium. *Mineral Resources of the U. S.*, 1927, I: 336-339.

CADMIUM ARSENATES. See ARSENATES.

CADMIUM SILICATES.* See SILICATES.

CALCIUM

BURR, M. S. Calcium and its compounds. In *Friend, Textbook inorg. chem.* III, pt. I: 10-150 (1925). Bibl. footnotes.

CALCIUM: Metabolism.*

AULDE, JOHN. Calcium therapy, the fundamental principle underlying rational therapeutics. Philadelphia, The author, 1928. 420 p. Contains references.

KLINKE, K. Neuere Ergebnisse der Calciumforschung. *Ergeb. Physiol.* 26: 235-238 (1928).

LUTTINGER, P. Calcium therapy in diseases of children. *Arch. Pediatrics* 45: 354-356 (1928).

MILLER, RUSSELL COOPER. A study of calcium and phosphorus balances with dairy cattle. *J. Dairy Sci.* 9: 91-92 (1926).

ROBERT, THÉRÈSE. Recherches sur le rôle physiologique du calcium chez les végétaux. Thèse, Faculté des sciences de Paris, 1915. 166 p. Bibl., p. 153-163.

STEWART, C. P., and PERCIVAL, G. H. Calcium metabolism. *Physiol. Rev.* 8: 308-312 (1928). 188 references.

CALCIUM ARSENATES. See ARSENATES.

CALCIUM CARBIDE

BYRNES, TOWNSEND and BRICKENSTEIN. Digest of electrochemical U. S. patents prior to 1903. Calcium carbide. *Chem. Met. Eng.* 5: 154, 198, 248, 292, 336, 382, 430, 480, 516 (1907); 6: 39, 132, 170-171, 218-219, 264 (1908).

CALCIUM PHOSPHATE

HOLT, L. EMMETT, JR., LA MER, VICTOR K., and CHOWN, H. BRUCE. The solubility product of secondary and tertiary calcium phosphate under various conditions. *J. Biol. Chem.* 64: 564-565 (1925). 37 references.

See also FERTILIZERS.

CALCIUM SILICATES. See SILICATES.

CALCIUM SILICIDES.* See SILICIDES.

CALORIMETRY

MCCANN, WM. S. Calorimetry in medicine. *Medicine* 3:84-98 (1924). 304 references.

ROTH, W. A. Calorimetrie organischer Verbindungen. In Houben-Weyl, Meth. org. Chem., 3rd ed., 1:1055-1129 (1925). Lists organic compounds with references.

See also COMBUSTION; HEAT OF.

CAMPHOR

GORI, G. Sulla determinazione quantitativa della canfora nei vegetali, nei prodotti industriali e farmaceutici. *Ann. chim. appl.* 15:283-300 (1925). 43 footnotes.

HEMPPEL, ALBERT. Ueber den gegenwärtigen Stand der Kampferfabrikation. *Chem.-Ztg.* 31:6-8 (1907). 19 footnotes.

MEYER, ANDRÉ. Le camphre synthétique: son état actuel. *Caoutchouc et Guttapercha* 21:12487 (1924).

MEYER, ANDRÉ. Le camphre synthétique. *Rev. gén. mat. plastiques* 1:113-122 (1925). Bibl. footnotes. Bibl., p. 119, 121-122.

ULLMANN, F., and COHN, G. "Synthetic camphor." In Ullmann's *Enzyk. tech. Chem.*, 2nd ed., 3:67-74 (1927). Patents, classified by raw materials.

See also ESSENTIAL OILS (Bournot).

CANNING AND PRESERVING

BIGELOW, W. D. Chemistry and the canning industry. *Ind. Eng. Chem.* 20:1288-1289 (1928). 80 references.

CLOUGH, RAY W., SHOSTROM, O. E., and CLARK, E. D. A study of the gases in canned foods. University of Washington Publications in Fisheries v. 1, no. 4, Sept., 1925. 14 p. Bibl., p. 14.

JACOBSEN, EDWARD. Handbuch für die Konserven-Industrie, Konserven-Fabriken und den Konserven-Grossbetrieb. Berlin, Pary, 1926. 2 v. Bibl., v. 2, p. 1416-1421.

MAGOON, C. A., and CULPEPPER, C. W. Scalding, precooking and chilling as preliminary canning operations. U. S. Dept. Agr., Bull. 1265. 1924. 48 p. 56 references.

ROUSSET, HENRI. Conserves alimentaires. Plus de 500 recettes de procédés ménagers et industriels propres à conserver viandes, oeufs, laitages, légumes, fruits, denrées alimentaires de toutes sortes. Paris, Desforges, Girardot, 1925. 253 p. Bibl., p. 246-248.

See also REFRIGERATION; VITAMINS (Kohman).

CAPILLARITY

BAKKER, G. Kapillarität und Oberflächenspannung. Leipzig, Akad. Verlagsges. 1928. 458 p. Bibl. footnotes.

MINKOWSKI, H. Kapillarität. In *Encyklopädie der mathematischen Wissenschaften* V, pt. I:558-613 (1907). 94 footnotes.

See also SURFACE TENSION.

CARBIDES

VOGEL, J. H., and SCHULZ, A. Carbide und Acetylen. Leipzig, Spamer, 1924. 130 p. Bibl. footnotes.

See also SILICIDES.

CARBOHYDRATES

ARMSTRONG, EDWARD F. The carbohydrates and the glucosides. 4th ed. London, Longmans, 1924. 293 p. Bibl., p. 245-287.

CRAMER, MARC. Les sucres et leurs dérivés. Paris, Doin, 1927. Bibl., p. 315-349.

EULER, H. v., and MYRBÄCK, K. Neue Ergebnisse über den enzymatischen Abbau und Aufbau des Kohlenhydrate. *Svensk Kem. Tid.* 37:173-184 (1925). Bibl. footnotes.

EULER, H. v., MYRBÄCK, K., and NILSSON, R. Neuere Forschungen über den enzymatischen Kohlenhydratabbau. I. *Ergeb. Physiol.* 26:531-533 (1928). 115 references.

GRAFE, VICTOR. Warenkunde und Technologie der Kohlenhydrate und der Waren der Kohlenhydratgruppe. Stuttgart, Poeschel, 1928. 631 p. Bibl. footnotes.

GRAY, HARRY LEB., and STAUD, CYRIL J. Recent advances in cellulose and starch chemistry. *Chem. Reviews* 4:371-373 (1927); *Tech. chem. Papier-Zellstoff-Fabr.* 25:85-92 (1928). 104 references.

HAWORTH, W. N. The constitution of sugars. N. Y., Longmans, 1929. 100 p. Bibl. footnotes.

JOSEPHSON, KARL. Nya resultat inom Kolhydratkemien. *Svensk Kem. Tid.* 41:45-48 (1929). 105 references.

KARRER, PAUL. Einführung in die Chemie der polymeren Kohlenhydrate, ein Grundriss der Chemie der Stärke, des Glykogens, der Zellulose und anderer Polysaccharide. Leipzig, Akademische Verlagsgesellschaft m. b. H., 1925. 285 p. Bibl. footnotes.

KALLMANN, O. Zucker. In Wiesner, *Der Rohstoffe des Pflanzenreiches*, 2121-2128 (1928). 233 references.

LEIBOWITZ, J. Die Entwicklung der Zuckerchemie in den letzten zwei Jahren. *Z. angew. Chem.* 39:1143-1148, 1240-1248 (1926). 122 references.

CARBOHYDRATES—Cont'd

LEIBOWITZ, J. Ueber den gegenwaertigen Stand der Chemie der Disaccharide und Trisaccharide. *Cellulosechem.* 9: 125-134 (1928). 99 bibl. footnotes.

NEUBERG, C., and LEIBOWITZ, J. Chemische Charakteristik der einfachen Kohlenhydrate. *In* Grafe, Handb. org. Warenkunde, 2, pt. 1: 1-60 (1928). 359 bibl. footnotes.

PRINGSHEIM, HANS. Die Kohlenhydrate. *In* Houben-Weyl, Meth. org. Chem. 2nd ed., III: 176-249 (1923). Bibl. footnotes.

PRINGSHEIM, HANS. Ueber die Chemie komplexer Naturstoffe. *Naturwissenschaften* 13: 1084-1090 (1925). 66 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Sugars, starches and gums. *In* Reports of the progress of applied chemistry 10: 452-480 (1925); 123 footnotes. 11: 480-502 (1926); 119 footnotes. 12: 489-511 (1927); 119 footnotes. 13: 507-530 (1928); 119 footnotes.

See also SUGAR and names of individual carbohydrates, *e. g.*, GALACTOSE, GLUCOSE, LACTOSE, ETC.

CARBOHYDRATES: Analysis.

LOOMIS, W. E. The determination of soluble carbohydrates. *Plant Physiol.* 2: 195-204 (1927). 49 references.

PICK, LEO. Studien über die Invertzuckerbestimmung. *Z. Zuckerind. Czechoslov. Rep.* 49: 211-216, 219-225, 235-241, 243-250 (1925). Bibl. through text.

WILLAMAN, J. J. The determination of polysaccharides. *Plant Physiol.* 2: 91-97 (1927). 28 references.

CARBOHYDRATES: Metabolism.

GOTTSCHALK, ALFRED. Ueber die Beziehungen zwischen pflanzlichem und tierischem Kohlenhydratabbau. *Ergeb. Physiol.* 25: 643-663 (1926). Bibl., p. 642-645.

JOHN, HENRY J. Carbohydrate metabolism in hyperthyroidism. *Endocrinology* 11: 578-581 (1927). 91 references.

MEYERHOF, O. Recent investigations on aerobic and anaerobic metabolism of carbohydrates. *J. Gen. Physiol.* 8: 541-542 (1927). 27 references.

RIPPERTON, JOHN C. Carbohydrate metabolism and its relation to growth in the edible canna. *Hawaii. Agr. Expt. Sta., Bull.* no. 56. 1927. 35 p. Literature, p. 34-35.

TOLLENAAR, D. Carbohydrate metabolism in leaves of *Nicotiana tabacum*

L. Lab. Pflanzenphysiol. Onderzoek (Wageningen) (Meded.) 12: 1-142 (1925). 104 references.

CARBON

BORN, FELIX. Die Messung des Dampfdruckes von Kohlenstoff. *Z. tech. Physik* 7: 30-31 (1926). 32 references.

FALCKE, V. Über das Gleichgewicht $C + CO_2 \rightleftharpoons 2 CO$. Ein Beitrag zur Thermodynamik des Hochofenprozesses. *Z. Elektrochem.* 33: 1-11 (1927). Bibl. footnotes.

CARBON: Activated.*

ARDAGH, E. G. Activated carbon. *J. Soc. Chem. Ind.* 40: 233T (1921). 19 references.

BLOCK, BERTHOLD. Die Anwendung und Wiederbelebung von Entfärbungskohle. *Chem. App.* 12: 222-224, 242-244 (1925); 13: 4-6, 27-30 (1926). German patents.

BRAEUER, A., and REITSTOETTER, J. Die Verfahren zur Herstellung von aktiven Kohlen. *Z. angew. Chem.* 41: 536-539 (1928). German patents, p. 539.

BREWSTER, J. F. Review of the literature on decolorizing carbons. *La. Planter* 70: 471-473 (1923).

CHANEY, N. K., RAY, ARTHUR B., and ST. JOHN, ANCEL. Properties of activated carbon which determine its industrial applications. *Trans. Am. Inst. Chem. Eng.* 15, pt. 1: 345-346 (1923). 33 references.

KAUSCH, OSCAR. Die aktive Kohle, ihre Herstellung und Verwendung. *Halle, Knapp*, 1928. 342 p. Bibl., p. 273-275, 296-306.

KREULEN, D. J. W. Résumé d'études concernant le charbon, publiées en 1923, 1924 et 1925. *Bull. féd. ind. chim. Belg.* no. 4: 533-540 (1925).

KUCHARENKO, J. A., KAGANOFF, J. H., and KRASILSHIKOFF, B. E. Active carbons and their use in the sugar industry. *Kief*, 1927. (Publ. of Govt. Expt. Inst. for Sugar Ind.) 213 p. List of patents with abstracts, p. 199-207 (81 references). Literature, p. 207-213 (256 references).

McKEE, R. H., and HORTON, P. M. Adsorbent carbons for many industries. *Chem. Met. Eng.* 32: 13-16 (1925). 23 patents and 22 references.

MANTELL, CHARLES L. Industrial carbon. *N. Y., Van Nostrand*, 1928. 410 p. Bibl., p. 395-396.

RUFF, OTTO, and MAUTNER, PAUL. Aktive Kohlen. *Kolloidchem. Beihefte* 26: 312-356 (1928). 62 footnotes.

RUFF, OTTO, and MAUTNER, PAUL. Die Verfahren zur Herstellung von aktiven Kohlen. *Z. angew. Chem.* 41: 774-775 (1928).

CARBON DIOXIDE

KAUSCH, O. Die Kohlensäure, ihre Herstellung und Verwendung. Hannover, Jänecke, 1910. Contains a list of German patents.

MELLOR, J. W. Carbon dioxide. *In his Inorg. theor. chem.* 6:1-78 (1925). History, 40 references; occurrence, about 250 references; formation and preparation, about 150 references; physical properties, about 1,000 references; solubility, about 200 references; chemical properties, about 350 references.

See also GASES (Burnett).

CARBON DISULFIDE

KAUSCH, OSCAR. Der Schwefelkohlenstoff. Berlin, Springer, 1929. 265 p. Bibl., p. 199-226; patents, p. 227-238.

MELLOR, J. W. Carbon disulphide. *In his Inorg. theor. chem.* 6:97-118 (1925). History, occurrence and preparation, about 75 references; physical properties, about 225 references; chemical properties, about 225 references.

MELLOR, J. W. The sulphides of carbon. *In his Inorg. theor. chem.* 6:94 (1926). About 75 references.

CARBON MONOXIDE

Automotive phases of carbon monoxide research summarized. *J. Soc. Automotive Eng.* 22: 579-584 (1928). 282 references.

KATZ, S. H. The hazard of carbon monoxide to the public and to industry. *Ind. Eng. Chem.* 17: 555-557 (1925). 17 footnotes.

NICLOUX, MAURICE. L'oxyde de carbone et l'intoxication oxycarbonique; étude chimico-biologique. Paris, Masson, 1925. 254 p. Bibl., p. 240-243, and in footnotes.

SAYERS, ROYD RAY, and DAVENPORT, SARA J. Carbon-monoxide literature. U. S. Public Health Service, Public Health Bull. no. 150. 1925. 54 p.

SCHIEBLER, H. Kohlenoxyd und zweiwertiger Kohlenstoff. *Z. angew. Chem.* 40: 1072-1078 (1927). 69 footnotes.

CARBONYL GROUP *

KOMM, ERNST. Charakteristische Kohlenstoff-Stickstoff-Kondensationen der Carbonylkörper. *In Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 1: 623-718 (1925). Bibl. footnotes.

CARBORUNDUM. See ABRASIVES.

CARBOXYLASE *

NEUBERG, C. Carboxylase. *In Abderhalden, Handb. biol. Arbeitsm.* 4, pt. 1: 565-582 (1925). Bibl. footnotes.

See also ENZYMES.

CARDIAZOL *

HAHN, THEODOR. Versuche mit "Cardiazol," einem neuen Analeptikum. *Inaug.-Diss., Tierärztl. Hochschule, Hannover*, 1926. 61 p. Bibl., p. 60-61.

CAROTIN

HOWARD, GRACE E. Pigment studies with special reference to carotinoids in fruits. *Annals Missouri Botanical Garden* 12: 192-195 (1925).

See also PIGMENTS: ANIMAL.

CARVACROL

WAGNER, A. Carvacrol. *Pharm. Zentralhalle* 69: 762-763, 776-777 (1928). 165 references.

CASEIN

Casein and its industrial application. *Chemistry and Industry* 44: 986-995, 1009-1011 (1925). References on casein, casein as sizing material, casein glues, casein plastics, casein paints, casein foods, and general bibl. at end.

LYNCH, F. C. C. Casein and its industrial applications. *Can. Chem. Met.* 9: 203-205, 221-225 (1925). Contains lists of patents.

SUTERMEISTER, EDWIN. Casein and its industrial applications. N. Y., Chem. Cat. Co., 1927. 296 p. Bibl. at end of chapters.

TAGUE, EDGAR L. Casein, its preparation, chemistry and technical utilization. N. Y., Van Nostrand, 1926. 218 p. Bibl., p. 206-213. 267 references.

See also CYSTINE; MILK; PLASTICS.

CATALASE

v. EULER, H. Reindarstellung der Katalasen. *In Abderhalden, Handb. biol. Arbeitsm.* 4, pt. 1: 455-462 (1925). Bibl. footnotes.

EZELL, B. D., and CRIST, J. W. Effect of certain nutrient conditions on activity of oxidase and catalase. *Mich. Agr. Expt. Sta., Bull.* 78: 22-24 (1927).

KNOLL, J. E. Catalase in relation to growth and to other changes in plant tissues. *Cornell Agr. Expt. Sta., Mem.* 106: 59-63 (1927).

LANTZ, CYRUS W. Respiration in corn with special reference to catalase. *Am. J. Bot.* 14: 104-105 (1927).

MORGULIS, S. Die Katalase. *Ergeb. Physiol.* 23, 1: 308-318 (1924). 263 references.

OPPENHEIMER, CARL. Katalasen. *In his Die Fermente*, p. 1828-1871 (1926). 326 footnotes.

CATALASE—Cont'd

- RHINE, LOUISA. Divergence of catalase and respiration in germination. *Bot. Gaz.* 78:65 (1924). 47 references.
See also ENZYMES.

CATALYSIS

- ARMSTRONG, E. F., and HILDITCH, T. P. Catalysis at solid surfaces. *Chemistry and Industry* 44:701-709 (1925). 38 footnotes.
- BANCROFT, WILDER D. Contact catalysis. N. Y., Columbia University Press, 1927. 15 p. References, p. 14-15.
- BANCROFT, WILDER D. Second report of the Committee on contact catalysis. *J. Phys. Chem.* 27:801-941 (1923); National Research Council, Reprint and Circular Series No. 50. Bibl. footnotes.
- BREDIG, G. Inorganic ferments. *In* Alexander, *Colloid chemistry* II: 327-347 (1928). 76 footnotes.
- BRONSTED, J. N. Acid and basic catalysis. *Chem. Reviews* 5:330-334, 338 (1928). 206 references.
- BRONSTED, J. N. Om syre- og basekatalyse. Copenhagen, Lunos, 1926. 120 p. Bibl., p. 116-120.
- BURK, ROBERT E. Sixth report of the Committee on contact catalysis. *J. Phys. Chem.* 32:1601-1645 (1928); National Research Council, Reprint and Circular Series No. 83. Bibl. footnotes.
- FRANKENBERGER, W. Neuere Forschungen auf dem Gebiet der heterogenen Katalyse. *Z. angew. Chem.* 41:523-531, 561-567 (1928). 286 footnotes.
- GREEN, STANLEY J. Industrial catalysis. London, Benn, 1928. 507 p. Bibl. footnotes.
- HENDERSON, G. G. Catalysis in industrial chemistry. London, Longmans, 1921. Bibl. footnotes; bibl., p. v.
- LANGENBECK, WOLFGANG. Ueber Aehnlichkeiten in der katalytischen Wirkung von Fermenten und von definierten organischen Stoffen. *Z. angew. Chem.* 41:740-745 (1928). 37 footnotes.
- MEERWEIN, HANS. Katalyse. *In* Houben-Weyl, *Meth. org. Chem.*, 3rd ed., II:466-592 (1925). Bibl. footnotes.
- REID, E. EMMET. Fifth report of the Committee on contact catalysis. *J. Phys. Chem.* 31:1121-1149 (1927); National Research Council, Reprint and Circular Series No. 78. 225 footnotes.
- RICE, F. O. The catalytic activity of dust particles. *J. Am. Chem. Soc.* 48:2099-2113 (1926). 53 footnotes.

- RIEDEL, ERIC K. Catalytic actions. *Chem. Reviews* 5:84 (1928). 35 references.

- SAUTER, E. R. Katalyse und Adsorption. *Kolloid.-Z.* 46:148-155 (1928). 53 footnotes.

- TAYLOR, HUGH S. Third report of the Committee on contact catalysis. *J. Phys. Chem.* 28:897-942 (1924); National Research Council, Reprint and Circular Series No. 59. Bibl. footnotes.

- TAYLOR, HUGH S. Fourth report of the Committee on contact catalysis. *J. Phys. Chem.* 30:146-171 (1926); National Research Council, Reprint and Circular Series No. 66. Bibl. footnotes.

- VITORIA, EDUARDO. La catálisis química, sus teorías y aplicaciones en el laboratorio y la industria. 3rd ed. Barcelona, Tipografía católica Casals, 1925. 636 p. Bibl., p. 15-22.

- WARBURG, OTTO H. Ueber die katalytischen Wirkungen der lebendigen Substanz; Arbeiten aus dem Kaiser Wilhelm-Institut für Biologie, Berlin-Dahlem. Berlin, Springer, 1928. 528 p. Bibl., p. 523-528.

CATAPHORESIS

- ABRAMSON, HAROLD A. Cataphoresis of blood cells and inert particles in sols and gels and its biological significance. *Colloid symposium monograph* 6:115-130 (1928). 38 bibl. footnotes.

See also COLLOIDS.

CELLS

- CHAMBERS, ROBERT. The nature of the living cell as revealed by micro-manipulation. *In* Alexander, *Colloid chemistry* II:467-486 (1928). 54 references.
- HARMS, WILHELM J. H. Körper und Keimzellen. Berlin, Springer, 1926. 2 v. Bibl., p. 969-1016.
- MACDOUGAL, D. T. The arrangement and action of the colloids of the plant cell. *In* Alexander, *Colloid chemistry* II:575-592 (1928). 26 footnotes.
- SCARTH, G. W. Mechanism of accumulation of dyes by living cells. *Plant Physiol.* 1:227-229 (1926). 30 references.
- SPEK, JOSEF. Experimentelle Beiträge zur Kolloidchemie der Zellteilung. *Kolloidchem. Beihefte* 12:1-91 (1920). Bibl. footnotes.

See also PLANT CELLS.

CELLULOID

- MUELLER, R. Celluloid. *In* Ullmann's *Enzykl. tech. Chem.*, 2nd ed., 3:126 (1929). List of German patents on substitutes for camphor in celluloid.

SCHMIDT, —. Neuerungen auf dem Gebiete der Herstellung von Zelluloid und Zelluloidersatzstoffen. *Kunststoffe* 14: 129-133, 167-170, 184-186 (1924). Patents through text.

See also LACQUERS; NITROCELLULOSE.

CELLULOSE

BLANCO, GALO W. Action of alkalis on cellulose. *Ind. Eng. Chem.* 20: 926-930 (1928). 66 references.

BIGGS, DAVID R. The determination of the ξ -potential in cellulose—a method. *J. Phys. Chem.* 32: 641-675 (1928). 64 footnotes.

EHRMANN, P. General study of cellulose and its principal derivatives. *Caoutchouc et Gutta-percha* 23: 13030-13032, 13064-13065, 13099-13102, 13138-13139, 13175-13176 (1926). 126 references.

GRAY, HARRY LEB., and STAUD, CYRIL J. Recent advances in cellulose and starch chemistry. *Chem. Reviews* 4: 371-373 (1927); *Tech. chem. Papier-Zellstoff-Fabr.* 25, no. 6: 85-92 (1928). 104 references.

HÄGGLUND, E. Ueber die Fortschritte auf dem Gebiet der Cellulose und Holzstoff-Fabrikation in den letzten Jahren. *Z. angew. Chem.* 41: 6-14 (1928). 89 footnote references.

HAWLEY, LEE F., and WISE, LOUIS E. The chemistry of wood. N. Y., Chem. Cat. Co., 1926. 334 p. Bibl. footnotes.

HIBBERT, HAROLD, and PARSONS, JOHN L. Studies on the reactions relating to carbohydrates and polysaccharides. XI. The oxidation of cellulose. *J. Soc. Chem. Ind.* 44: 485T (1924). 58 references.

MEYER, KURT H., and MARK, H. Ueber den Bau des kristallisierten Anteils der Cellulose. *Ber.* 61B: 593-614 (1928); *Cellulosechemie* 9: 61-74 (1928). 52 footnotes.

MICHEL-JAFFARD, R. (Present status of our knowledge of the intimate structure of cellulose fibers.) *Chimie et industrie* 19: 811-818, 1003-1012 (1928); *Papier* 31: 831-834, 837-841, 945-948, 951-952, 1057-1063 (1928). 53 references.

MONTONNA, R. E. Chemistry and technology of cellulose. *Paper Trade J.* 86, no. 18: 61-67 (1928); *Tech. Assoc. Papers* 11, no. 1: 84-90 (1928). Bibl. through text.

PAYRAS, G. (The action of metallic hydroxides on cellulose.) *Rev. gén. mat. plastiques* 2: 759-771 (1926); 3: 3-15 (1927). 86 references.

ROSSMAN, JOSEPH. Hydrated cellulose. A review of the U. S. patents relating

to gelatinizing or hydrating of pulp by mechanical and chemical means. *Paper Trade J.* 87, no. 7: 61-62 (1928). 29 patents.

ROSSMAN, JOSEPH. Manufacture of high alpha-cellulose. *Paper Trade J.* 86, no. 15: 59-62 (Apr. 12, 1928); *Paper Makers' Mo. J.* 66: 313-316 (1928); *Tech. Assoc. Papers* 11, no. 1: 187-191 (1928); *Pulp Paper Mag. Can.* 26: 1821-1823 (1928). 34 patents.

SCHORGER, ARLIE W. The chemistry of cellulose and wood. N. Y., McGraw-Hill, 1926. 596 p. References, p. 467-469; Bibl. footnotes.

Voss, —. Die Einwirkung von Metallhydroxyden auf Zellulose. *Kunststoffe* 15: 192-196, 211-213 (1925). 83 footnotes.

See also CORN (Sweeney); COTTON; FIBERS; PAPER.

CELLULOSE: Action of Bacteria.

BRADLEY, LEON A., and RETTGER, LEO F. Studies on aerobic bacteria commonly concerned in the decomposition of cellulose. *J. Bact.* 13: 343-345 (1927).

THAYSEN, A. C., and BUNKER, H. J. The microbiology of cellulose, hemicelluloses, pectins and gums. London, Oxford University Press, 1927. 363 p. References to the biological destruction of cellulose.

CELLULOSE: Digestion.

YONGE, C. M. Digestion of cellulose by invertebrates. *Science Progress* 20: 242-248 (1925). References through text.

CELLULOSE ETHERS *

BERL, E., and SCHUPP, H. Zur Kenntnis der Celluloseäther. *Cellulosechemie* 10: 41-59 (1929). Bibl. footnotes. Patents and bibl., p. 41.

CELTUIM. See HAFNIUM.

CEMENT

ABRAMS, DUFF A. Brief bibliography on Portland cement. *Proc. Am. Soc. Testing Materials* 25, I: 172-177 (1925).

BATES, P. H., and EMLEY, W. E. Structural cements, limes and plasters. *International critical tables* II: 124 (1927). 50 references.

BERGER, E. E. Calcium sulphate retarders for Portland cement. U. S. Bureau of Mines. Reports of Investigations no. 2705, Sept., 1925. 18 references.

BERL, E., and LÖBLEIN, FR. Beitrag zur Kenntnis der tonerreicheren Schmelzzement. *Zement* 15: 642-643, 673-677, 741-745, 759-762, 783-785 (1926). 50 footnotes.

CEMENT—Cont'd

- BOGUE, R. H. Digest of the literature on the constitution of Portland cement clinker. Portland Cement Assoc. Fellowship, Paper no. 3. 1927. 66 p. Bibl., 63-66. 71 references. *Reprinted from Concrete*, 1926-1927.
- BOGUE, R. H. Digest of the literature on the nature of the setting and hardening in Portland cement. Rock Products, 31, no. 10: 69-71; no. 12: 62-63; no. 14: 61-62; no. 16: 67-70; no. 18: 65-68; no. 20: 65-68 (May-Sept., 1928); Portland Cement Assoc. Fellowship, paper no. 17. 1928. 48 p. 70 references, p., 47-48.
- BURCHARD, E. F., and BAGLEY, B. W. Cement in 1923. U. S. G. S., Mineral Resources 1923, II: 318-325. About 200 references on cement materials, cement and concrete.
- CRUM, R. W. Bibliography on quick hardening cements. Proc. 5th Annual Meeting Highway Research Board, National Research Council, pt. I: 170-172 (1926).
- ECKEL, EDWIN C. Cements, limes and plasters; their materials, manufacture and properties. 3rd ed., with chapters on alumina cements and high-strength Portlands. N. Y., Wiley, 1928. 699 p. References at end of some of the chapters.
- FRENKEL, G. Kolloidchemische Technologie des Portlandzementes. *In* Liesegang, Kolloidchem. Tech., 625-633 (1927). Bibl. footnotes.
- GEISSNER, HERMANN. Das Abbinden des Zementes. Kolloid-Z. 46: 207-216 (1928). 60 footnotes.
- HATT, W. K., and MILLS, R. E. Physical and mechanical properties of Portland cements and concretes. Purdue Univ., Eng. Expt. Sta., Bull. 34. 1928. 99 p. Bibl., p. 91-95. 94 references.
- KIRK, RAYMOND E. The manufacture of Portland cement from marl. University of Minnesota, Eng. Expt. Sta., Bull. no. 4. 1926. 98 p. Bibl., p. 93-98.
- KLEINLOGEL, ADOLF. Einflüsse auf Beton; die chemischen, mechanischen und sonstigen Einflüsse von Luft, Wassern, Säuren, Laugen, Ölen, Dämpfen, Erden, Lagergütern, u. Dgl. auf Zement, Mörtel, Beton und Eisenbeton, sowie die Massnahmen zur Verringerung und Verhütung dieser Einflüsse ein Auskunftsbuch für die Praxis. Berlin, Ernst und Sohn, 1925. 331 p. Bibl. footnotes.
- LESLEY, ROBERT W., LOBER, J. B., and BARTLETT, G. S. History of the Portland cement industry in the United States, with appendices covering progress of the industry by years and an outline of the organization and activities of the Portland Cement Association. N. Y., International Trade Press, 1924. 330 p. Bibl. on lime, cement and concrete, p. 6-8.
- MELLOR, J. W. Cement. *In* his Inorg. theor. chem. 6: 559-560 (1925). About 75 references.
- OTZEN, R. Hochwertiger Zement. Zement 15: 780-783 (1926). Covers 1919 to 1926.
- RICHARDSON, CHARLES H. Cement materials of Kentucky. The Kentucky Geological Survey. Ser. vi. Geologic Reports, v. 29. 1927. Bibl., p. 153-154.
- RICHARZ, H. Ein Ueberblick über die Literatur von der Konstitution des Portlandzementklinkers. Tonind.-Ztg. 52: 853-854, 1081 (1928). 81 references.
- VAIL, JAMES G. Silicate cements. *In* his Soluble silicates in industry, 1928, p. 165-209. 195 footnotes.
- WECKE, F. Handbuch der Zementliteratur. Berlin, Zementverlag, 1927. 1447 p. This book is a bibliography of cement, which has been compiled for the Verein deutscher Portland-Cement-Fabrikanten. It is arranged according to the kind of cement, and most of the articles are annotated. Patents are included. There is a name index, patent index, subject index, and also a list of periodicals and the German libraries in which these periodicals are to be found.

See also MAGNESIA CEMENTS.

CERAMICS

- BAUMANN, HENRY N., JR. Heat balance study of ceramic kilns. J. Am. Ceram. Soc. 10: 860-896 (1927). Bibl. footnotes. Bibl., p. 896.
- Bibliography of clay and silica industry. Coburg, Müller and Schmidt, 1928. 72 p. List of over 900 books on porcelain, stoneware, glass, enamel, etc.
- COHN, WILLI M. The problem of heat economy in the ceramic industry. J. Am. Ceram. Soc. 7: 558-562 (1924). 130 references.
- COHN, WILLI M. Some factors influencing the thermal properties of minerals and products of the ceramic industry. J. Am. Ceram. Soc. 11: 302-306 (1928). 113 references (1919-1928).
- FUNK, W. Fortschritte der Keramik in den Jahren 1923-1925. Chem.-Ztg. 50: 669-671, 683-684, 702-703, 735-737, 799-801, 827-829 (1926). 403 footnotes.

KOHL, H. Keramik. *In* Liesegang, Kolloidchem. Tech., 577-624 (1927). Bibl. footnotes.

MACGEE, A. ERNEST. The heat required to fire ceramic bodies. *J. Am. Ceram. Soc.* 9: 206-247 (1926). Bibl. footnotes.

MIELDS, M. Fortschritte der Keramik. 1926. Fortschrittsber. Chem.-Ztg., no. 4: 112-118 (1927); 133 footnotes. 1927. *Ibid* no. 3: 92-102 (1928). 245 footnotes.

Progress in foreign research and technology of rock products in 1928. *Rock Products* 31: 220-223 (1928). Bibl. through text.

Progress in research and technology of rock products in 1927. *Rock Products* 31, no. 3: 52-56 (1928). Bibl. through text.

SINGER, FELIX. Fortschritte der Keramik und ihre Bedeutung für die chemische Industrie. *Z. angew. Chem.* 39: 1279-1284, 1318-1321 (1926).

STEGER, W. Technische Fortschritte der Feinkeramik im Jahre 1927. *Keram. Rund.* 36: 5-6, 44-46, 61-64 (1928). 103 references.

Untersuchungs- und Prüfungsmethoden keramischen Rohstoffe und Erzeugnisse. *Ber. deut. keram. Ges.* 8: 44-57, 92-114 (1927). Bibl. through text.

Serials

Literatur-Uebersicht. Beilage zu den "Berichte der deutschen keramischen Gesellschaft." 1921-

See also ABRASIVES; CLAY; GLASS; REFRACTORIES; SCUMMING; ETC.

CEREALS *

KENT-JONES, D. W. Modern cereal chemistry. Liverpool, Northern Pub. Co., 1927. 446 p. Bibl., p. 408-427.

LARMOUR, RALPH K. A comparative study of the glutelins of the cereal grains. *J. Agr. Research* 35: 1118-1120 (1927).

CEREBROSPINAL FLUID

SCHMITT, W. Theorie der Kolloidreaktionen der Rueckenmarkfluessigkeit. *Kolloidchem. Beihefte* 26: 58-160 (1928). 228 references, p. 150-160.

CHALCEDONY. *See* SILICA AND SILICATES.

CHARCOAL. *See* CARBON: ACTIVATED; WOOD DISTILLATION.

CHAULMOOGRA OIL

JUMELLE, RENÉ L. Les huiles de chaulmoogra, leurs origines, leurs caractères et leur mode d'action. Thèse, Faculté de médecine de Paris, 1926. 87 p. Bibl., p. 83-87.

PERROT, ÉMILE. Chaulmoogra et autres graines utilisables contre la lèpre. Lons-Le-Saunier, Impr. L. Declume, 1926. 59 p. (France. Office national des matières premières végétales pour la droguerie, la pharmacie, la distillerie et la parfumerie. Travaux. Notice no. 24). Bibl. footnotes.

READ, B. E. Bibliography of chaulmoogra oil. *China Med. J.* 39: 623-631 (1925). 157 references.

CHEESE

DOANE, CHARLES F., and LOWSON, H. W. Varieties of cheese: descriptions and analyses. U. S. Dept. of Agriculture, Bull. no. 608. 1928. 68 p. Source of analytical data, p. 60-64.

VAN SLYKE, LUCIUS L., and PRICE, WALTER V. Cheese; a treatise on the manufacture of American Cheddar cheese and some other varieties—intended as a text-book for the use of dairy teachers and students in classroom and workroom—prepared also as a handbook and work of reference for the daily use of practical cheesemakers in cheese factory operations. N. Y., Orange Judd, 1927. 364 p. Bibl., p. 330-344.

See also DAIRY PRODUCTS; MILK.

CHEMICAL AFFINITY *

FLÜRSCHHEIM, B. The nature, division and distribution of chemical force. *Chemistry and Industry* 44: 246-250 (1925). 30 footnotes.

HUDLESTON, LAWSON J. Chemical affinity. London, Longmans, 1928. 138 p. References, p. 134-135.

CHEMICAL APPARATUS

REITSTÖTTER, JOSEF. Die Kolloidmühlen und ihre technische Anwendung. *In* Liesegang, Kolloidchem. Tech., 57-68 (1927). Bibl. footnotes.

SOCIETY OF CHEMICAL INDUSTRY. General, plant and machinery. *In* Reports of the progress in applied chemistry 10: 5-22 (1925); 70 footnotes. 11: 5-21 (1926); 131 footnotes. 12: 5-24 (1927); 94 footnotes. 13: 5-34 (1928); 182 footnotes.

See also DAIRY INDUSTRY; FOAM SEPARATOR; HEAT; APPARATUS; SUGAR (Gundermann); ETC.

CHEMICAL ENGINEERING *

TYLER, CHAPLIN. Chemical engineering economics. N. Y., McGraw-Hill, 1926. 271 p. Bibl. at end of each chapter.

CHEMICAL EQUILIBRIUM

CARPENTER, C. D., and LEHRMAN, ALEX. The solid-liquid temperature relation in the ternary system $\text{H}_2\text{SO}_4\text{-HNO}_3\text{-H}_2\text{O}$ and its relation to

CHEMICAL EQUILIBRIUM—*Cont'd*

the ternary system $\text{N}_2\text{O}_5\text{-H}_2\text{O-SO}_3$. Trans. Am. Inst. Chem. Eng. 17:72-73 (1926). 53 references.

DESCH, C. H. Ferrous alloys. International critical tables II:449 (1927). 60 references.

Equilibres chimiques. In Table annuelles V:1041-1073 (1917-1922); VI:962-988 (1923-1926).

GAYLER, M. L. V. Aluminium alloys. International critical tables II:400 (1927). 46 references.

HAUGHTON, J. L. Non-ferrous alloys. International critical tables II:419-420 (1927). 149 references.

HUDSON, O. F. Lead and tin alloys. International critical tables II:413 (1927). 46 references.

JELLINEK, KARL, and ULOTH, ROBERT. Ueber die Chlortensionen von Metallchloriden und die chemischen Konstanten des Chlors. Z. physik. Chem. 119:161-200 (1926). Bibl. footnotes.

KURNAKOW, N. S. Singulare Punkte chemischer Diagramme. Z. anorg. allgem. Chem. 146:69-102 (1925). Bibl. footnotes.

MINOR, JESSIE E. A study of the equilibrium in the alcoholysis of esters. Diss., Bryn Mawr College, 1917. 58 p. Bibl., 81 references, p. 55-57.

CHEMICAL KINETICS

BODENSTEIN, MAX. Chemische Kinetik. Ergeb. exakt. Naturwissenschaften I:209 (1922). 27 references.

HINRICHSSEN, F. W., and MAMLOCK, L. Chemische Atomistik: Die Grundbegriffe der chemischen Atomistik in historischer Entwicklung. Stereochemie. In Encyklopaedie der mathematischen Wissenschaften V, pt. I:323-390 (1906). 165 footnotes.

HINSHELWOOD, C. N. Homogeneous reactions. Chem. Reviews 3:227-256 (1926). 52 footnotes.

JANDER, W. Neuere Forschungen über die Reaktionen im festen Zustand. Z. angew. Chem. 41:73-79 (1928). Bibl. p. 79. 36 references.

KARLSSON, K. G. Ueber die Zersetzungsgeschwindigkeit einiger Ester in ihrer Abhängigkeit von der Wasserstoffionen Konzentration. Z. anorg. allgem. Chem. 145:1-57 (1925). Bibl. footnotes.

KORNFELD, G. Neuere Fragen der chemischen Kinetik. Z. angew. Chem. 42:459-462 (1929). 34 footnotes.

RICE, FRANCIS O. The mechanism of homogeneous organic reactions from the physical-chemical standpoint.

N. Y., Chem. Cat. Co., 1928. 217 p. Bibl. footnotes.

THON, NATHANIEL. Die Chlorknallgasreaktionen. Fortschritte Chem., Phys., physik. Chem. 18, no. 11. 89 p. 1926. 22 references, p. 89. Also bibl. footnotes.

See also MUTAROTATION.

CHEMICAL REARRANGEMENT *

NAMETKIN, S. Die Umlagerung alizyklischer Kerne ineinander. Samm. chem. und chem-tech. Vorträge 28:37-70 (1925). Numerous bibl. footnotes.

CHEMICAL WARFARE

Gases. Index Cat. S. G. O., 3rd ser., 5:1057-1062 (1925).

HANSLIAN, R. Der chemische Krieg. 2. Aufl. Berlin, Mittler, 1927. 411 p. Bibl., p. 384-395.

MEYER, JULIUS. Der Gaskampf und die chemischen Kampfstoffe. 1925. Contains many bibls.

UNITED STATES. *Surgeon-General's Office*. The medical department of the U. S. army in the world war; prepared under the direction of Maj. Gen. M. W. Ireland. vol. 14: Medical aspects of gas warfare. Washington, Govt. print. off., 1926. 876 p. References at end of most of the chapters.

CHEMICALS *

ASHE, A. W., and BOORMAN, H. G. T. Chemicals. (Resources of the Empire Series, vol. VII.) London, Benn, 1924. 207 p. Bibl., p. 189-191.

WALLER, PETER. Probleme der deutschen chemischen Industrie. Halberstadt, Meyer, 1928. 241 p. Bibl., p. 239-241.

CHEMILUMINESCENCE *

NATIONAL RESEARCH COUNCIL. *Subcommittee on Chemiluminescence*. Chemiluminescence; report of the subcommittee on chemiluminescence. Bull. National Research Council, no. 59. 1927. 62 p. Bibl. footnotes.

CHEMOTHERAPY

DYSON, GEORGE MALCOLM. The chemistry of chemotherapy. London, Benn, 1928. 272 p. References at the end of each chapter.

FOURNEAU, E. La chimiotherapie. In Dix ans d'efforts scientifiques et industriels, p. 623-628 (Paris, Chimie et industrie). Bibl., p. 635-638.

FOURNEAU, E. Relations entre la constitution chimique des corps et leur action thérapeutique. Compt. rend. 6th Conférence internationale, 1925:196-211. Classified by compounds.

JACOBS, WALTER A. Certain aspects of the chemotherapy of protozoan and

bacterial infections. *Medicine* 3:192-193 (1924). 38 references.

KLOPSTOCK, FELIX. Chemotherapie der Tuberkulose und Lepra. In *Kolle und Wassermann, Handb. der pathogenen Mikroorganismen V*: 1265-1270 (1928).

KOLMER, JOHN A. Principles and practice of chemotherapy, with special reference to the specific and general treatment of syphilis. Philadelphia, Saunders, 1926. 1106 p. References at end of each chapter.

SCHNITZER, ROBERT. Methodik der Chemotherapie protozoischer Infektionen. In *Abderhalden, Handb. biol. Arbeitsm.* 8, pt. 2: 741-746 (1928). 209 references.

WOLLERSHEIM, A. Fortschritte der Chemotherapie auf dem Gebiete der Veterinaer-Medizin. *Z. angew. Chem.* 41: 145-146 (1928). 14 references, p. 146.

See also ANTIMONY: ORGANIC COMPOUNDS; ARSENIC: ORGANIC COMPOUNDS; ARSPHENAMINE; MERCURY: ORGANIC COMPOUNDS.

CHICLE. See GUMS.

CHLORAL

TAP, JACOB M. P. De intraveneuze chloralhydraat-narcosse bij het paard; een experimenteel en klinisch onderzoek naar hare waarde in de operatieve chirurgie. Proefschrift, Veeartsenijk. Hoogeschool, Utrecht, 1923. 145 p. Literature, p. 143-145.

CHLORATES*

ESCALES, R. Die Explosivstoffe. V. Chloratsprengstoffe. Leipzig, Veit, 1910. 208 p. Bibl., 200-201; patents, p. 202-203.

CHLORIC ACID

Chlorsäure. In *Gmelin's Handb. anorg. Chem.*, 8th Auflage, System-Nummer 6: 307-361 (1927). Bibl. through text.

CHLORINE

Chlor. *Gmelin's Handb. anorg. Chem.*, 8 Auflage, System-Nummer 6, Berlin, Verlag Chemie, 1927. 442 p.

JELLINEK, KARL, and ULOTH, ROBERT. Ueber die Chlortension von Metallchloriden und die chemischen Konstanten des Chlors. *Z. physik. Chem.* 119: 161-300 (1926). Bibl. footnotes.

ORNSTEIN, G. Chlorgas-Anwendung. *Gesundh.-Ing.* 61: 600-601 (1928). Most important papers since 1900.

See also GASES.

CHLORINE DIOXIDE

Chlordioxyd. In *Gmelin's Handb. anorg. Chem.*, 8th Auflage, System-Nummer 6: 234-247 (1927). Bibl. through text.

CHLORITES.* See ALUMINUM SILICATES; MICA.

CHLOROPHYLL

GORDONOFF, T. Ueber die pharmakotherapeutische Bedeutung des Chlorophyll. *Z. ges. exptl. Med.* 54: 294-312 (1927). 38 references.

WILLSTÄTTER, RICHARD M., and STOLL, ARTHUR. Investigations on chlorophyll; methods and results. Lancaster, Pa., The Science Press Printing Co., 1928. 385 p. Bibl., p. 379-380.

See also PIGMENTS: PLANT.

CHLOROPICRIN *

ROARK, R. C. Chloropicrin: a bibliography, with special reference to the use of chloropicrin as an insecticide (1848-1925). U. S. Bureau Chemistry, Chem. Bibl. I (1926). 73 p. Annotated bibl. of 287 titles in mimeographed form. Supplement issued in May, 1927. 29 titles.

CHLOROPLAST *

ZIRKLE, CONWAY. The structure of the chloroplast in certain higher plants. *Am. J. Bot.* 13: 336-340 (1926). 99 references.

CHOCOLATE. See CACAO.

CHOLESTEROL

ARNDT, HANS-JOACHIM. Zur Kenntnis des Cholesterinstoffwechsels. *Z. ges. exptl. Med.* 54: 413-414 (1927). 45 references.

CAMPBELL, J. M. H. Cholesterol in health and disease. *Quart. J. Med.* 18: 393-422 (1925). 164 references.

MINOVICI, STEFAN. Contribution à l'étude du cholestérol au point de vue chimique et physiologique. *Bull. soc. chim. biol.* 9: 1129-1164 (1927). Bibl. footnotes; bibl., p. 1163-1164.

SESTINI, CORRADO. Sulla quantità e il rapporto fra colesterina e acidi grassi totali del siero di sangue nell'iper-tiroidismo sperimentale. *Biochem. terapia sper.* 12: 304-306 (1925). 67 references.

CHROMITE *

LADOO, R. B. Chromite. In *his Non-metallic minerals*, 137 (1925). 13 references.

CHROMIUM

JOHNSTON, W. D., JR. Chromium. *Mineral Industry* 33: 128 (1924); 35: 110-111 (1927); 36: 78-80 (1928). Includes alloys and chromium plating.

POLANSKY, VICTOR S. Chromium plating; a list of references. *Brass World* 22: 272-273 (1926). 50 references, annotated.

SCHNEIDEWIND, RICHARD. A study of patents dealing with the electrode-

CHROMIUM—Cont'd

position of chromium. Dept. of Engineering Research, University of Michigan, Engineering Research Bull. no. 8. 49 p. Patent bibl. of chromium plating, containing abstracts and comments on patents dealing with the electrodeposition of metallic chromium, p. 23-49.

SCHNEIDEWIND, RICHARD. Study of chromium plating. Univ. of Michigan, Eng. Research Bull., No. 10. 1928. 141 p. Bibl., p. 95-121. 111 references.

VALLANCE, REECE H., and ELDRIDGE, ARTHUR A. Chromium and its congeners. Friend, Text-book of inorganic chemistry, VII, pt. III. 1926. 380 p.

CHROMIUM SILICATES *

MELLOR, J. W. The chromium silicates. *In his* Inorg. theor. chem., 6; 866 (1925). 25 references.

CHROMIUM SILICIDES.* See SILICIDES.**CIDER. See APPLES.****CITRIC ACID**

REICHARD, O. Nachweiss und Bestimmung von Citronensäure und die Ergebnisse der an Wein bisher angestellten Untersuchungen. Z. Nahr. Genussm. 51: 274-289 (1926). 122 footnotes.

SALMONY, A. Die bisherigen Weinsäure- und Citronensäure-Patente. Chem.-Ztg. 51: 902-903 (1927). Patents through text.

CITRUS INDUSTRY *

WILSON, C. P. Relation of chemistry to the citrus products industry. Ind. Eng. Chem. 20: 1307 (1928). 52 references.

CLAYS

BROWN, GEORGE G. Clays and shales of Michigan and their uses. Michigan, Geological and Biological Survey, Publ. 36, Geological Series 30. 1926. 444 p. Bibl. footnotes.

DIETRICH, WALDEMAR F. The clay resources and the ceramic industry of California. Calif., Dept. of Natural Resources, Division of Mines and Mining, Bull. no. 99. 383 p. Bibl. footnotes.

HEATH, FRED T. Bibliography and abstracts on the utilization of pebbly clays for heavy clay products manufacture. Bull. Am. Ceramic Soc. 4: 165-188 (1925). Annotated.

HODSON, FLOYD. Origin of bedded Pennsylvania fire clays in the United States. J. Am. Ceram. Soc. 10: 721-746 (1927). Bibl. footnotes; bibl., p. 745-746.

MCDOWELL, J. SPOTTS. Mineral constituents of clay. J. Am. Ceram. Soc. 9: 60 (1926). 18 references.

NIEDERLEUTHNER, RUDOLF. Unbildsame Rohstoffe keramischer Massen, Magerungsmittel, Flussmittel und feuerfeste Stoffe. Wien, Springer, 1928. 577 p. Bibl. footnotes.

POLLACK, VINCENT. Die Beweglichkeit bindiger und nichtbindiger Materialien. Halle (Saale), Knapp, 1925. 139 p. Bibl. footnotes.

RIES, HEINRICH. Bibliography of clay deposits. Bull. Am. Ceram. Soc. 4: 428-510 (1925). Classified by locality.

RIES, HEINRICH. Clays, their occurrence, properties, and uses, with especial reference to those of the United States and Canada. 3rd ed. N. Y., Wiley, 1927. 613 p. Contains references.

ROSS, DONALD W. Nature and origin of refractory clays. J. Am. Ceram. Soc. 10: 704-720 (1927). Bibl. footnotes; bibl., p. 719-720.

TAMM, OLOF F. S. Experimental studies on chemical processes in the formation of glacial clay. Stockholm, Kungl. boktryckeriet, Norstedt, 1925. 20 p. Sweden. Sveriges geologiska undersökning, ser. c. Avhandlingar och uppsatser, n: o 333. Arsboek 18 (1924) n: o 5. Bibl., p. 20.

VICKERS, A. E. J. The application of colloid chemistry to the study of clays. Trans. Ceram. Soc. 28: 97-100, 143-147 (1929). 151 references.

WIESE, OTTO. Die Anfarbemethode in der Keramik und bei Mineraluntersuchungen. Diss., Tech. Hochschule, Berlin, 1927. 47 p. (109-155). Bibl., p. 153-155.

WILSON, HEWITT. Ceramics; clay technology. N. Y., McGraw-Hill, 1927. 296 p. Contains references.

See also ALUMINUM SILICATES; CERAMICS; REFRACTORIES; SCUMMING.

COAGULATION

KRUYT, H. R. The mechanism of coagulation. *In* Alexander, Colloid chemistry I: 321-322 (1926). 53 references.

See also COLLOIDS.

COAL

FIELDNER, A. C., and DAVIS, J. D. Modern views of the chemistry of coal of different ranks as conglomerates. Trans. Am. Inst. Min. Met. Eng. 71: 227-245 (1925). 28 footnotes.

Handbuch der Kohlenwirtschaft: Ein Nachschlagewerk für Kohlenerzeuger, Kohlenhändler und Kohlenverbraucher. Berlin, 1926. Bibl., p. 609-622.

LEGG, VERNON H., and WHEELER, R. V. The composition of coal: plant cuticles in coal. *Gt. Brit. Safety in mines research board*, Paper no. 17. 10 p. Bibl. references.

MCCLELLAND, E. H. Literature of the coal industry; a classified list of the more important books, serials and trade publications during the year; with a few of earlier date, not previously announced. *Coal Ind.* 2: 31-32 (1919); 3: 61-63 (1920); 4: 6-8 (1921); 5: 19-22 (1922); 6: 9-12 (1923); 7: 39-42 (1924). *Coal Trade Bull.* 52: 218-220 (1925); 54: 241-244 (1926). Issued as a reprint by the Carnegie Library of Pittsburgh.

MORGAN, J. J. Constitution of coal. *In* Recent progress in science in relation to the gas industry (*Am. Gas Assoc.*, 1926), p. 7. 74 references.

NORTH, FREDERICK J. Coal, and the coalfields in Wales. London, Milford, 1926. 175 p. Bibl., p. 148-167.

PARR, SAMUEL W. The classification of coal. *Univ. Ill., Eng. Expt. Sta., Bull.* no. 180. 1927. 59 p. Bibl., p. 51-59. 111 references.

POTONIÉ, ROBERT. Einführung in die allgemeine Kohlenpetrographie. Berlin, Borntraeger, 1924. 285 p. Bibl., p. 264-270.

QUARENDON, R. Pressure and the elucidation of the chemical constitution of coal. *Chemistry and Industry* 44: 679 (1925). 31 references.

STRACHE, H., and LAUT, R. Kohlenchemie. Leipzig, Akad. Verlagsges. 1924. Bibl. footnotes and bibl. at end of chapters.

TROPSCH, HANS. Unsere heutige Kenntnisse über den Humusanteil und die Bitumina der Kohlen. *Brennstoffchem.* 8: 369-374 (1927). 43 footnote references.

WAYLAND, H. Die chemische Vorgänge bei der Entstehung der Kohlen. *Naturwissenschaften* 15: 334-335 (1927). 30 references.

YOUNG, CLINTON M., and ALLEN, H. C. Kansas coal. Part I. Occurrence and production. Part II. The Chemistry of Kansas coal. *Bull. University of Kansas, Eng. Bull.* no. 13. 202 p. Bibl., p. 201-202.

See also LIGNITE.

COAL: Analysis.

GREAT BRITAIN. *Dept. of Scientific and Industrial Research*. Fuel Research Board. Methods of analysis of coal. *Gt. Brit., Dept. of Sci. Ind. Research*. Fuel Research Board, Physical and Chemical Survey of the National Coal Resources no. 7. 1927. 35 p. Bibl. footnotes.

COAL: Carbonization.

ASKEW, HENRY O. Report on the Fischer process. *N. Z. Dept. Sci. Ind. Research, Bull.* no. 6. 1928. Annotated bibl., p. 23-28. 51 references.

BARIL, A. La carbonisation de la houille à basse température. *In* Dix ans d'efforts scientifiques et industriels, 1914-24, p. 108-122. Paris, Chimie et industrie. Bibl. footnotes.

BRITTAİN, A., ROWE, F. M., and SINNATT, F. S. Study of the oils (tars) from the low-temperature carbonization of coal. *Fuel in Sci. and Ind. Practice*, 4: 263-269, 299-327 (1925). 100 references.

CHAUX, R. Combustibles liquides à partir de la houille. *Bull. soc. chim.* 43: 407-411 (1928). 160 references.

COURAU, ROBERT, and BESSON, HENRI. Distillation des combustibles à basse température. Paris, Doin, 1928. 356 p. Bibl., p. 345-347.

FISCHER, FRANZ. The conversion of coal into oils. London, Benn, 1925. 284 p. Bibl., p. 274-278. 218 references.

GENTRY, FRANK M. Technology of low temperature carbonization. Baltimore, Williams and Wilkins, 1928. 399 p. Bibl. of 413 references, p. 370-380.

MANNING, A. B., KING, J. G., and SINNATT, F. S. The "unsaturated hydrocarbons" in the gases from the carbonisation of coal. *Gt. Brit., Dept. Sci. Ind. Research, Fuel Research Board, Tech. Paper No. 19*. 1928. 19 p. Bibl., p. 18-19.

MILLER, A. E. Motor fuel from coal—Description of the recent work of Bergius, Fischer and Patart. *Am. Petroleum Inst.* 8, no. 6: 152-159 (1927). 130 references, classified according to process.

ROBERTS, JOHN. Coal carbonization, high and low temperature; a treatise on the principles and processes of manufacturing coke and semi-coke. London, Pitman, 1927. References at end of most of the chapters.

ROSE, H. J. Coal carbonization. *In* Recent progress in science in relation to the gas industry (*Am. Gas. Assoc.*, 1926), p. 29. 66 references

See also COKE.

COAL: Nitrogen in.

COBB, J. W. Nitrogenous constituents of coal. *Trans. Am. Inst. Min. Met. Eng.* 71: 211-214 (1925). 16 footnotes.

COAL: Pulverized.

GODBERT, ALBERT L. Laboratory methods of determining the inflamma-

COAL: Pulverized—Cont'd

bility of coal dusts. Historical survey and preliminary examination of the problems involved. Gt. Brit., Safety in Mines Research Board, Paper no. 31. 1927. 68 p. Selected bibl., p. 67-68.

GREIG, EUGENE F. Some problems connected with the determination of the fineness of coal dust. Gt. Brit., Safety in Mines Research Board, Paper no. 25. 1926. 31 p. Bibl. references, p. 30-31.

COAL: Storage.

DAVIS, JOSEPH D., and REYNOLDS, D. A. Spontaneous heating of coal. U. S. Bureau of Mines, Tech. Paper 409. 1928. 74 p. Bibl., p. 66-74.

HOSKINS, A. J. Study of spontaneous combustion in storage coal. Purdue University, Eng. Expt. Sta., Bull. no. 30:55-59 (1928). 97 references.

COAL: Washing.*

RICHARDS, ROBERT H., and LOCKE, CHARLES E. Bibliography of ore dressing and coal washing. 1921. Mineral Ind. 30:786-793 (1922); 200 references. 1924. *Ibid.* 33:809-817 (1924). *See also* references through text, p. 759-817. 1926. *Ibid.* 35:735-792 (1927). 150 footnotes; bibl., p. 781-792. 1927. *Ibid.* 36:675-687 (1928).

COAL TAR

BRITTAİN, A., ROWE, F. M., and SINNATT, F. S. Study of the oils (tars) from the low-temperature carbonization of coal. Fuel in Sci. and Ind. Practice, 4:263-269, 299-327 (1925). 100 references.

KOHLER, HIPPOLYTE. Eigenschaften und Bestandteile des Steinkohlenteeres. *Teer* 25:181-186, 230-236, 343-347, 479-483, 495-498 (1927). Bibl. footnotes.

WEISS, J. M. Tar refining and tar products. *In* Recent progress in science in relation to the gas industry (Am. Gas Assoc., 1926), p. 100. 160 references.

COBALT

DRURY, C. W. Cobalt. Mineral Ind. 35:152-153 (1927); 36:115-116 (1928).

COBALT ARSENATES. See ARSENATES.**COBALT ARSENIDES***

DOELTER, C. Kobalt- und Nickelarsenide. *In his* Handb. Mineralchem. 4, pt. 1:739-794 (1926). Bibl. footnotes.

DOELTER, C. Verbindungen von Kobalt und Arsen. *In his* Handb. Mineralchem. 4, pt. 1:680-695 (1926). Bibl. footnotes.

COBALT SILICATES.* See SILICATES.**COBALT SILICIDES.* See SILICIDES.****COCO-NUT OIL***

SNODGRASS, KATHERINE. Copra and coconut oil. Leland Stanford Junior University, Food Research Institute. Fats and Oils Studies, no. 2. 1928. 135 p. Bibl. note, p. 119-122.

COD LIVER OIL

BILLS, CHARLES E. The principal chemical researches on cod liver oil. Chem. Reviews 3:440-442 (1927). 90 references.

COFFEE

ALLERS, RUDOLF. Ueber die Wirkung der Kaffeebestandteile. Wiener med. Wochschr. 77:1067-1068 (1927). 34 references.

JANUSCHKEM, HANS. Ueber die biologischen Wirkung des Kaffees. Wiener med. Wochschr. 77:369 (1927). 50 references.

COKE

AGDE, G., and SCHMIDT, H. Theorie der Reduktionsfähigkeit des Steinkohlens. 1928. 165 p. Bibl., p. 155-158.

FIELDNER, A. C. Combustibility of coke. Chem. Met. Eng. 29:1057 (1923). 18 references.

GLUUD, W. Handbuch der Kokerei. 2 v. Halle, Knapp, 1927-1928. Bibl. footnotes.

HAILSTONE, H. J. Short bibliography of coke. Gas J. (London) 170:591-592; 172. Coke no.: 2 (May 27, Nov. 9, 1925).

JONES, J. H., KING, J. G., and SINNATT, F. S. The reactivity of coke. I. Standardized method for the determination of comparative values. Dept. Sci. Ind. Research, Fuel Research Tech. Paper no. 18. 1927. 32 p. Bibl., p. 30-32. About 100 references.

MEZGER, ROBERT, and PISTUR, FRIEDRICH. Die Reaktionsfähigkeit des Koks; ihre Ursachen, alte und neue Wege zu ihrer Bestimmung. Halle (Saale), Knapp, 1927. 88 p. Bibl., p. vi-viii.

POWELL, A. B. Coke. *In* Recent progress in science in relation to the gas industry (Am. Gas Assoc., 1926), p. 20. 64 references.

WEYMAN, GEOFFREY. The combustion of coke in one stage. J. Soc. Chem. Ind. 44:60T (1925). About 50 references.

See also COAL; GAS MANUFACTURE.

COLLOIDS

ALEXANDER, JEROME. Colloid chemistry, theoretical and applied, by selected international contributors,

- collected and edited by Jerome Alexander. N. Y., Chem. Cat. Co., 1926. . Bibl. at end of most of the chapters.
- ALEXANDER, JEROME, and BRIDGES, C. B. Some physico-chemical aspects of life, mutation and evolution. *In* Alexander, Colloid chemistry II: 57-58 (1928). 64 references.
- AMSDEN, JOHN P. A study of Bredig gold sols. Thesis, Columbia University, 1926. 27 p. Bibl., p. 27.
- BAEVERTZ, MARY. A study of Bredig platinum sols. Thesis, Columbia University, 1925. 19 p. Bibl., p. 19.
- BLOCH, ERNST. Flockung von Kolloiden. *In* Abderhalden, Handb. biol. Arbeitsm. 3B: 386-412 (1926). Bibl. footnotes.
- BOAS, FRIEDRICH. Die Pflanze als kolloides System. *Naturw. u. Landw.* No. 14: 134-139 (1928). 147 references.
- BRANDENBURGER, H., and MARK, H. Ueber die mechanischen Eigenschaften gewisser Gele und ihre Beeinflussung durch chemische Zusätze. *Kolloid-Z.* 34: 12-19 (1924). About 50 references.
- CHWALA, A. Kolloidchemie und Schaedlingsbekämpfungsmittel. (Mit besonderer Berücksichtigung der Arseniate). *Kolloid-Z.* 46: 227-238 (1928). 14 footnotes.
- COFMAN, VICTOR. Colloid dynamics. *Chem. Reviews* 4: 47-49 (1927). 59 references.
- COLLOIDES. *In* Tables annuelles V: 1262-1285 (1917-1922); VI: 1169-1204 (1923-1926).
- CORRENS, CARL W. Die petrographisch wichtigen Methoden der Kolloidchemie. *Fortschritte Mineral. Krist. Petr.* 10: 153-156 (1925). 75 references.
- DHAR, N. R., and CHAKRAVARTI, D. N. Hydration and viscosity of sols in the presence of electrolytes. *In* Alexander, Colloid chemistry II: 105-120 (1928). 45 footnotes.
- FREUNDLICH, HERBERT. Colloid and capillary chemistry. London, Methuen, 1926. 883 p. Extensive bibl. footnotes.
- FREUNDLICH, HERBERT. Kolloidchemie und Biologie. 3rd ed. of Kapillarchemie und Physiologie. Dresden and Leipzig, Steinkopff, 1924. 47 p. Bibl., p. 45-47.
- FREUNDLICH, HERBERT. New conceptions in colloidal chemistry. London, Methuen, 1926. 147 p. Bibl. at the end of each chapter.
- FREUNDLICH, HERBERT. Neuere Fortschritte der Kolloidchemie und ihr biologische Bedeutung. *Protoplasma* 2: 278-299 (1927). Bibl. footnotes.
- Gels and sols. Index-Cat. S. G. O., 3rd ser., 6: 9-10 (1926).
- VON HAHN, F.-V. Die Methoden der biologischen Dispersoidanalyse. *In* Abderhalden, Handb. biol. Arbeitsm. 3B: 459-594 (1926). Bibl. footnotes.
- VON HAHN, FRIEDRICH-VINCENZ. Dispersoidanalyse; die Methoden der Teilchengrößenbestimmung und ihre theoretischen Grundlagen. Dresden und Leipzig, Steinkopff, 1928. 553 p. Bibl. footnotes.
- VON HAHN, FRIEDRICH-VINCENZ. Ueber quantitative Koagulationsmethoden bei Suspensoiden. *Kolloid-Z.* 29: 226-236 (1921). 32 footnotes.
- HAMBURGER, EDNA R. A study of ferric oxybromide hydrosols. Thesis, Columbia University, 1926. 35 p. Bibl., p. 33-34.
- HATSCHEK, EMIL. Laboratory manual of elementary colloid chemistry. 2nd ed., London, Churchill, 1925. 153 p. References at end of most chapters.
- HATSCHEK, EMIL. Some properties and theories of gels. *J. Soc. Chem. Ind.* 48: 398-399 (1929). 40 references.
- KOPACZEWSKI, W. L'état colloidal et l'industrie. Vol. I, 1925. Vol. II, 1927. Paris, Beranger. 344 p. Bibl. at end of chapters.
- KRUYT, HUGO R. Colloids, a textbook. N. Y., Wiley, 1927. 262 p. References at end of each chapter except the first.
- KRUYT, R. Die Methoden zur Bestimmung der Ladungsgrösse kolloider Teilchen. *Kolloid-Z.* 37: 358-365 (1925). 19 references.
- KUHN, A. Die Methoden zur Bestimmung der Teilchengrösse. *Kolloid-Z.* 37: 365-377 (1925). 50 references.
- KUHN, A. Ueberblick unserer jetzigen Kenntnisse über Wasserbindung in Kolloiden. *Kolloid-Z.* 35: 275-294 (1924). 112 footnotes.
- LAYTON, ROY FRANCIS. The rôle of electrolyte in the formation of gold sols. Thesis, Columbia University, 1926. 29 p. References, p. 29.
- Lectures on the biologic aspects of colloid and physiologic chemistry; a series of lectures given at the Mayo Foundation and the Universities of Minnesota, Iowa, Washington (St. Louis), and the Des Moines Academy of Medicine, Iowa, 1925-1926. Philadelphia, Saunders, 1927. 244 p. Bibl. at end of some of the lectures.

COLLOIDS—Cont'd

- LIESEGANG, RAPHAEL EDUARD. Chemische Reaktionen in Gallerten. 2. umgearb. Aufl. Dresden and Leipzig, Steinkopff, 1924. 90 p. Bibl., p. 85-88.
- LIESEGANG, RAPHAEL E. Kolloidchemie. Dresden, Steinkopff, 1926. 176 p. About 800 references.
- LIESEGANG, RAPHAEL E. Kolloide in der Technik. Dresden and Leipzig, Steinkopff, 1923. 157 p. Bibl. footnotes.
- LIESEGANG, RAPHAEL E. Kolloidchemische Technologie; ein Handbuch kolloidchemischer Betrachtungsweise in der chemischen Industrie und Technik. Dresden and Leipzig, Steinkopff, 1927. 1047 p. Bibls. interspersed; bibl. footnotes; index of authors cited p. 1030-1041.
- Literatur-Uebersicht. Kolloid-Z. 29: 330-333 (1921); 30: 70-74, 133-138, 396-408; 31: 45-48, 362-365 (1922); 32: 287-294, 349-359; 33: 368-378 (1923); 34: 119-122, 186-189, 237-244 (1924); 36: 55-58, 178-183, 250-252; 37: 116-119 (1925).
- LUMIÈRE, AUGUSTE. Rôle des colloïdes chez les êtres vivants. Paris, Masson, 1921. 311 p. Bibl., p. 155-283.
- MATTSON, SANTE EMIL. Die Beziehungen zwischen Ausflockung, Adsorption und Teilchenladung mit besonderer Berücksichtigung der Hydroxytionen. Kolloidchem. Beihefte 14: 227-313 (1922). Bibl. footnotes.
- MOLLER, HANS PETER. Rhythmische Fällungserscheinungen in pflanzlichen Zellmembranen. Kolloidchem. Beihefte 14: 97-146 (1921). Bibl. footnotes.
- DU NOÛY, PIERRE L. Surface equilibria of biological and organic colloids. N. Y., Chem. Cat. Co., 1926. 212 p. Bibl., p. 195-202.
- OSTWALD, WOLFGANG. Licht und Farbe in Kolloiden. Optische Heterogenität, Polarisation, Drehung, usw. Dresden, Steinkopff, 1924. 556 p. Bibl. footnotes.
- OSTWALD, Wo. Ueberblick über das Gebiet der Gallerten und Gele. Kolloid-Z. 46: 248-267 (1928). 61 bibl. footnotes.
- PAULI, Wo., and VALKO, EMERICH. Ueber die Deutung der physikalisch-chemischen Analyse der Kolloide vom Standpunkt der Elektrolyththeorie. Z. physik. Chem. 121: 161-179 (1926). Bibl. footnotes.
- REITSTÖTTER, JOSEF. Die Herstellung kolloider Lösungen anorganischer Stoffe. In Liesegang, Kolloidchem. Tech., 5-56 (1927). Bibl. footnotes.
- REITSTÖTTER, JOSEF. Die Kolloidmühlen und ihre technische Anwendung. In Liesegang, Kolloidchem. Tech., 57-68 (1927). Bibl. footnotes.
- REITSTÖTTER, JOSEF. Fortschritte in der Herstellung von kolloiden Lösungen der Metalloide und deren Verbindungen, sowie Uebersicht der wichtigsten Schutzkolloide und Reinigungsverfahren von Kolloiden. Oester. Chem.-Ztg. 31: 47-51 (1928). Protective colloids, p. 49-51; Purification of colloids, p. 51.
- REITSTÖTTER, J. Neuere Arbeiten ueber die Darstellung und die Eigenschaften kolloider Metalle und deren Verbindungen. Oester. Chem.-Ztg. 30: 217-220 (1927). 55 footnote references.
- RINDE, HERMAN. The distribution of the sizes of particles in gold sols prepared according to the nuclear method. Inaug.-Diss., Upsala, 1928. 226 p. Bibl., p. 223-226.
- SCHIEBER, JOHANNES. Ueber die gallertbildung fetter Oele. Kolloid-Z. 46: 337-345 (1928). 59 footnotes.
- SEN, K. C. Theorie der Peptisation und Schutzwirkung von Kolloiden und Nichtelektrolyten. Kolloid-Z. 36: 193-202 (1925). 41 footnotes.
- THORNE, P. C. L. Kolloide Lösungen von Kohlenstoff in Wasser. Kolloid-Z. 31: 119-132 (1922). 71 references.
- WIEGNER, G., MAGASANIK, J., and GESSNER, H. Hysteresiserscheinungen und sog. mechanische Koagulationen von Solen mit stäbchenförmigen Ultramikronen, insbesondere von Vanadinpentoxysolen, verglichen mit Fibrinsolen. Kolloid-Z. 30: 145-165 (1922). 57 footnotes.
- WEISER, HARRY B. The hydrous oxides. N. Y., McGraw-Hill, 1926. 452 p. Bibl. footnotes.
- WOODWARD, HELEN Q. Bredig and Kohlschütter silver sols as influenced by the presence of certain electrolytes. Thesis, Columbia University, 1925. 26 p. Bibl., p. 25.
- ZSIGMONDY, RICHARD. Elektrische Teilchenladung und der neue Begriff "Mizelle." Z. physik. Chem. 101: 292-322 (1922). Bibl. footnotes.
- ZSIGMONDY, RICHARD. Kolloidchemie; ein Lehrbuch. 5. Aufl. Leipzig, Spamer, 1925. Bibl. footnotes.
- See also ADSORPTION; BAUXITE; CLAY; COAGULATION; ENZYMES; FLOCCULATION; FLotation; GELATIN; GLUE; INK; LIESEGANG PHENOMENON; LIPOIDS; MILK; NITROCELLULOSE; PAINT; PROTEINS; RUBBER; SILICA AND SILICATES; SOAP; TANNIC ACID AND TANNINS; URANIUM.

COLORIMETRY

BAUER, E. Kurzer Abriss der Spektroskopie und Kolorimetrie. Leipzig, Barth, 1907. 122 p. Bibl. footnotes.

REDELLEN, G. Colorimetrie. In Houben-Weyl, Meth. org. Chem. 3rd ed., I: 259-290 (1925). Bibl. footnotes.

YOE, JOHN H. Colorimetry. In Alexander, Colloid chemistry II: 196-198 (1928).

YOE, JOHN H. Photometric chemical analysis (colorimetry and nephelometry). I. Colorimetry. N. Y., Wiley, 1928. 771 p. Classified bibl., p. 535-718.

COLUMBIC ACID *

HART, DAVID. The reduction of columbic acid and the measurement of the oxidation potential of the pentavalent-trivalent columbian system. Thesis, Columbia University, 1926. 36 p. Bibl., p. 36.

COLUMBIUM

EPHRAIM, F., and KROLL, H. Niob. In Gmelinkraut, Handb. inorg. Chem. VI, pt. 1: 192-275, 882-911 (1928). Bibl. through text.

MELLOR, J. W. Columbium. In his Inorg. theor. chem. 9: 837-882 (1929). Bibls. through text.

COMBUSTION

AMERICAN GAS ASSOCIATION. *Industrial Gas Section*. Combustion; a reference book on the theory and practice of the principles of combustion, prepared under the direction of the Industrial Gas Section of the American Gas Association. N. Y., The Association, 1924. 74 p. Bibl., p. 74.

BONE, WILLIAM A., and TOWNEND, D. T. A. Flame and combustion in gases. N. Y., Longman, 1927. 548 p. Bibl. at end of each section.

COWARD, HUBERT F., and JONES, G. W. Limits of inflammability of gases and vapors. U. S. Bureau of Mines, Bull. 279. 99 p. Bibl., p. 88-93.

MENZEL, HEINRICH. Die Theorie der Verbrennung; die stöchiometrischen und thermochemischen Grundlagen der Verbrennungs- und Vergasungsvorgänge. Dresden and Leipzig, Steinkopff, 1924. 120 p. Bibl., p. 117.

WEYMAN, GEOFFREY. The combustion of coke in one stage. J. Soc. Chem. Ind. 44: 47-50T, 51-60T (1925). 53 references.

See also COAL: CARBONIZATION.

COMBUSTION: Heat of.*

HARTMAN, HERMANUS. De verbrandingswarmte van homologe en isomere dicarbonzuren en dicarbon-

zuuranhydriden. Proefschrift, Delft, 1928. 126 p. Bibl. footnotes.

KHARASCH, M. S. Heats of combustion of organic compounds. Bureau of Standards J. Research 2: 421-426 (1929). 246 references.

See also CALORIMETRY.

COMPRESSIBILITY

BEATTIE, JAMES A., and BRIDGEMAN, OSCAR C. Bibliography on the compressibility of ten gases. Proc. Am. Acad. Arts Sci. 63: 296-306 (1928). Elasticité. Compressibilité. In Tables annuelles V: 1-9 (1917-1922); VI: 7-18 (1923-1926).

RICHARDS, THEODORE W. Compressibility, internal pressure and change in atomic volume. J. Franklin Inst. 198: 25-27 (1924). List of 32 papers.

CONCRETE

ABRAMS, D. A. Calcium chloride as an admixture in concrete. Proc. Am. Soc. Testing Materials 24, II: 830-834 (1924); Lewis Inst., Structural Materials Research Lab., Bull. no. 13. 1924. Bibl., p. 53-57. 50 references.

ABRAMS, D. A. Digest of literature on methods of making flexure and tension tests of concrete. Proc. Am. Soc. Testing Materials 25, I: 205-208 (1925). 34 references with annotations.

ABRAMS, D. A. Effect of hydrated lime and other powdered admixtures in concrete. Chicago, Lewis Inst., Structural Materials Research Lab., Bull. no. 8. 1925. Bibl., p. 21-22. 50 references.

ABRAMS, D. A. Studies of bond between concrete and steel. Chicago, Lewis Inst., Structural Materials Research Lab., Bull. no. 17. 1925. 20 p. Bibl., p. 18-20. 34 references.

AMERICAN CONCRETE INSTITUTE. *Committee E-4*. Fire resistance of concrete. Proc. Am. Concrete Inst. 21: 300-317 (1925). 229 references arranged chronologically from 1877.

ATWOOD, W. G., and JOHNSON, A. A. Marine structures. Washington, National Research Council. 1924. 534 p. Bibl., p. 496-519.

Bibliographies on modulus of elasticity, Poisson's ratio, inelastic deformation and volume changes of concrete. Proc. Am. Soc. Testing Materials 28 I: 377-393 (1928). 326 references.

CRANE, THEODORE. Concrete building construction. N. Y., Wiley, 1927. 689 p. Bibl., p. 671-678.

GLANVILLE, W. H. The permeability of Portland cement concrete. Gt. Brit., Dept. Sci. Ind. Research,

CONCRETE—Cont'd

Building Research Board, Tech. Paper no. 3. 1926. 50 p. Bibl., p. 49-50.

GONNERMAN, HARRISON F. Effect of size and shape of test specimen on compressive strength of concrete. Chicago, Lewis Inst., Structural Materials Research Lab., Bull. no. 16. 1925. 16 p. Bibl., p. 15-16.

GONNERMAN, HARRISON F., and MCKESSON, C. L. Studies of curing concrete in a semi-arid climate. Chicago, Lewis Inst., Structural Materials Research Lab., Bull. no. 15. 1925. Bibl., p. 36-37. 21 references.

HATT, WILLIAM K. Researches in concrete. Lafayette, Ind., Purdue University, Bull. no. 24, Eng. Expt. Sta. 1925. 102 p. Bibl., p. 88-102. 300 references.

HATT, W. K., and MILLS, R. E. Physical and mechanical properties of Portland cements and concretes. Purdue Univ., Eng. Expt. Sta., Bull. 34. 1928. 99 p. Bibl., p. 91-95. 94 references.

HITCHCOCK, FRANK A., and DWYER, JOHN R. Properties and manufacture of concrete building units. U. S. Bureau of Standards, Circ. no. 304: 40-41 (1926). 28 references.

KERSTEN, CARL. Construcciones de hormigon armado. Barcelona, G. Gili, 1925. 814 p. Bibl. footnotes.

LAGAARD, MAURICE B. Integral waterproofing compounds for concrete. University of Minnesota, Eng. Expt. Sta., Bull. no. 6. 1927. 25 p. Bibl., p. 25.

LEA, FREDERICK M., and BRADY, F. L. Slag, coke breeze and clinker as aggregates. Gt. Britain, Dept. Sci. Ind. Research, Building Research Board, Special Report no. 10. 1927. 22 p. Bibl., p. 21-22.

LEWANDOWSKY, —. Ueber Befestigungen und Sohlendichtungen aus tübingartigen Betonplatten. Tonind.-Ztg. 38: 147-152 (1914). Bibl. footnotes.

LEWE, VICTOR. Pilzdecken und andere trägerlose Eisenbetonplatten; Berechnung, Entwurf und Ausführung der nach mehreren Richtungen bewehrten Eisenbetondecken, strenge Lösung von Plattenproblemen. Tabellen der Durchbiegungen, Momente und Querkkräfte von Platten. Berlin, Ernst, 1926. 182 p. Bibl., p. 179-182.

See also CEMENT; GUNNITE.

CONCRECTIONS *

SCHADE, H. Concretions. In Alexander, Colloid chemistry II: 803-844 (1928). 57 footnotes.

CONDENSATION *

KEMPF, RICHARD. Kondensation. In Houben-Weyl. Meth. org. Chem., 3rd ed., II: 716-945 (1925). Bibl. footnotes.

CONDENSATION AND COOLING.

KUENEN, J. P. Theorie der Verdampfung und Verflüssigung von Gemischen. Leipzig, Barth, 1906. 244 p. Bibl. footnotes.

SEELIGER, R. Die Abkühlung heisser Körper in Gasen und Flüssigkeiten. Physik. Z. 26: 295 (1925); 27: 344 (1926). 88 references.

SPETER, M. Zur Geschichte des Gegenstrom-Kuehlapparates. Chem.-Ztg. 32: 3-5, 654 (1908); Chem. App. 1: 65-70, 86-88 (1914); 14: 221-222, 239-241 (1927); 16: 59-61 (1929). Bibl. footnotes.

See also DISTILLATION; EVAPORATION.

CONDUCTIVITY. See ELECTRICAL CONDUCTIVITY; THERMAL CONDUCTIVITY.**CONFECTIONERY**

ROUSSET, HENRI. Bonbons, pastilles, fondants, caramels, chocolates, nougats, berlingots et sucreries de toutes sortes. Paris, Desforges, Girardot, 1926. 268 p. Bibl., p. 259-261.

See also CACAO; MARCPANE; SUGAR.

CONTACT POTENTIAL *

COEHN, ALFRED. Kontakpotential. Ergeb. exakt. Naturwissenschaften 1: 196 (1922). 48 references.

COPPER

DAVIS, W. The story of copper. N. Y., Century, 1924. 385 p. Bibl., p. 365-380.

UNITED STATES. Bureau of Standards. Kupfer . . . Genehmigte Übersetzung des Circular no. 73; "Copper," des Bureau of Standards, Washington, U. S. A. ii. Aufl. vom 14. Nov. 1922. Berlin, VDI-Verlag, G. m. b. H., 1926. 120 p. Bibl., p. 111-120.

WELLS, ROGER CLARK. Chemistry of deposition of native copper from ascending solutions. U. S. Geological Survey, Bull. no. 778. 1925. 71 p. Bibl. references.

COPPER: Alloys.

BAUER, O., and HANSEN M. Der Aufbau der Kupfer-Zink Legierungen. Mitt. Materialprüfungsamt, Special no. 4: 141-146 (1927). 156 references.

HAMILTON, H. English brass and copper industries to 1800. N. Y., Longmans, 1926. 388 p. Bibl., p. 369-378.

See also ALLOYS; BRASS.

COPPER: Metallurgy

CHEMNITUS, F. Elektrolytische Kupferraffination. Chem.-Ztg. 52: 981-983, 1002-1003 (1928). 18 footnotes.

TOBELMANN, H. A. Hydrometallurgy of copper. *In* Liddell, Non-ferrous metallurgy, II: 1084-1085 (1926). 48 references.

WAEHLERT, M. Die Kupferraffination. Halle, Knapp, 1927. 142 p. Bibl., p. 139-140.

COPPER: Ores.

LOCKE, AUGUSTUS. Leached outcrops as guides to copper ore. Baltimore, Williams & Wilkins, 1926. 175 p. Selected bibl., p. 10-17.

COPPER ARSENATES. *See* ARSENATES.

COPPER HYDROXIDE

MÜLLER, ERICH. Das System Kupferoxyd, Kupferhydroxyd, Cuprit, Natronlauge. *Z. physik. Chem.* 105: 73-118 (1923). Bibl., p. 117-118.

COPPER SILICATES. *See* SILICATES.

COPPER SILICIDES.* *See* SILICIDES.

COPPER SULFIDES

HENGLEIN, M. Bornit. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 152-166 (1926). 60 footnotes.

HENGLEIN, M. Covellin. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 97-107 (1926). 40 footnotes.

HENGLEIN, M. Kupferglanz. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 73-96 (1926). 100 footnotes.

HENGLEIN, M. Kupferkies. *In* Doelter, Handb. Mineralchem. 4, pt. 1: 140-152 (1926). 70 footnotes.

CORK

BAKER, CLARA M. Cork and cork products. A bibliography. Pittsburgh, Carnegie Library School, 1924. Classified and annotated.

BREHMER, W. v., and KONSTANTY, E. Kork. *In* Wiesner, Rohstoffe der Pflanzenreiches, p. 1798-1800 (1928). 110 references.

CORN

JODIDI, S. L. Isolation and identification of some organic nitrogenous compounds occurring in etiolated corn seedlings. *J. Agr. Research* 34: 655-656 (1927). 24 references.

KEITH, M. HELEN. A bibliography of researches bearing on the composition and nutritive value of corn and corn products. University of Illinois, Agr. Expt. Sta., Bull. no. 257. 1925. 151 p. Alphabetical with subject index.

SWEENEY, O. R. The commercial utilization of corncobs. Iowa State College of Agriculture and Mechanic Arts, Bull. 73 (Vol. 23, no. 15, Sept. 10, 1924). Bibl., p. 91-111. 128 references, annotated.

VINSON, CARL G. Some nitrogenous constituents of corn pollen. *J. Agr.*

Research 35: 275-278 (1927). 50 references.

CORPUS LUTEUM.*

ASDELL, S. A. Growth and function of corpus luteum. *Physiol. Rev.* 8: 313-345 (1928). Bibl., p. 341-345. 165 references.

CORROSION

ATWOOD, W. G., and JOHNSON, A. A. Marine structures. Washington, National Research Council, 1924. 534 p. Bibl., p. 519-521.

CREUTZFELDT, W. H. Korrosionforschung von Standpunkte der Metallkunde. Braunschweig, Vieweg, 1924. 38 p. Bibl. footnotes.

DONALD, M. B. Corrosion. *Trans. Inst. Chem. Eng.* 1923, 1: 108. 16 references.

EVANS, ULICK, R. The corrosion of metals. N. Y., Longmans, 1924, 259 p. Bibl. footnotes.

HUFF, W. J. Corrosion. *In* Recent progress in science in relation to the gas industry (Am. Gas Assoc., 1926), p. 147. 61 references.

LUBOWSKY, KURT. Eisenbeton unter dem Einfluss elektrischer Ströme. *Elektrotech. Z.* 35: 36 (1914). 58 references.

RAWDON, HENRY S. Protective metallic coatings. N. Y., Chem. Cat. Co., 1928. 277 p. Bibl., p. 237-266.

SCHOLTEN, W. VAN WUELLEN. Ueber die Korrosion des Eisen. *Gas u. Wasserfach* 71: 872-880 (1928). 123 footnotes.

SCHOLTEN, W. VAN WUELLEN. Korrosionsversuche mit Eisen. *Gas u. Wasserfach* 72: 456-458 (1929). 43 footnotes.

SPELLER, FRANK N. Corrosion, causes and prevention; an engineering problem. N. Y., McGraw-Hill, 1926. 621 p. Selected bibl. on the corrosion of ferrous metals, p. 564-577.

TURNER, T. HENRY, and BUDGEN, N. F. Metal spraying: the origin, development, and applications of the metal-spray process of metallization. Griffin, 1926. References, p. 164-168.

VERNON, W. H. J. Bibliography of metallic corrosion. London, Arnold, 1928. 341 p. Classified.

See also ALLOYS.

CORUNDUM

EARDLEY-WILMOT, V. L., Bibliography on corundum. *In* Abrasives, pt. II: Corundum and diamond (Canada, Dept. of Mines, Mines Branch Publ. no. 677). 1927. p. 35.

LADOO, R. B. Corundum and emery. *In* his Non-metallic Minerals, 1925, p. 174-175. 30 references.

COTTON

BURNS, ALAN C. Investigations on raw cotton. Deterioration of cotton during damp storage. Egypt. Ministry of Agriculture. Tech. and Sci. Service. Bull. no. 71. 1927. 92 p. Bibl., p. 87-92.

GALLUP, WILLIS DE L. A chemical study of the development of cotton bolls and the rate of formation of gossypol in the cotton seed. J. Agr. Research 36: 480 (1928).

HALLER, R. Chemische Technologie der Baumwolle. Berlin, Springer, 1928. 711 p. Bibl. footnotes.

HARRIS, JAMES A. The relationship between the concentration of the soil solution and the physiochemical properties of the leaf-tissue fluids of Egyptian and upland cotton. J. Agr. Research 32: 646-647 (1926).

HARRIS, JAMES A., *et al.* The leaf-tissue fluids of Egyptian cottons. J. Agr. Research 31: 1033 (1926).

HARRIS, JAMES A., *et al.* Sulphate content of the leaf-tissue fluids of Egyptian and upland cotton. J. Agr. Research 31: 661 (1926).

TURNER, A. J. Study of the cotton fibre. Agr. J. India 21: 290-294 (1926). 65 references.

See also FIBERS.

COUMARIN

RADCLIFFE, L. G., and SHARPLES, E. H. Vanillin, piperonal and coumarin. Perfumery Essent. Oil Rev. 15: 397-399 (1924).

CREATINE

HINES, HARRY M. Creatine metabolism. Thesis, University of Iowa, 1922. 33 p. Bibl., p. 16-17, 33.

HUNTER, ANDREW. Creatine and creatinine. London, Longmans, 1928. 281 p. Bibl., p. 243-273.

MCCRUDDEN, FRANCIS H. A practical application of a knowledge of the creatinin content of the urine. *In* Life Ins. Med. I: 134-135 (1926). 29 references. (New England Mut. Life Ins. Co.)

CRESOLS

BUREŠ, E. (Some chloro- and bromo-derivatives of *o*- and *m*-cresols.) Chem. Listy 21: 108-114, 148-162, 221-227, 261-265 (1927). 107 references.

CRISTABOLITE.* *See* SILICA AND SILICATES.

CRITICAL PHENOMENA

KUENEN, J. P. Theorie der Verdampfung und Verflüssigung von Gemischen. Leipzig, Barth, 1906. 244 p. Bibl. footnotes and bibl. on p. 94.

See also KINETIC THEORY.

CRYOLITE. *See* FLUORSPAR.

CRYSTAL STRUCTURE

GOLDSCHMIDT, V. M. Konstruktion von Kristallen. Z. tech. Physik 8: 251-264 (1927). Bibl. footnotes.

GRAHMANN, WERNER. Kristallstruktur und chemische Konstitution. Z. Kristall. 57: 48-93 (1923). Bibl. footnotes.

JOHNSEN, A. Fortschritte im Bereich der Kristallstruktur. Ergeb. exakt. Naturwissenschaften. 1: 294-297 (1922). 110 references.

MARK, HERMANN F. Die Verwendung der Röntgenstrahlen in Chemie und Technik; ein Hilfsbuch für Chemiker und Ingenieure. Leipzig, Barth, 1926. 528 p., Bibl., p. 492-518.

MORSE, JARED KIRTLAND. Bibliography of crystal structure. Chicago, University Press, 1928. 164 p. The bibliography is arranged alphabetically by authors under each year.

NEUBURGER, MAXIMILIAN C. Kristallbau und Röntgenstrahlen. Sammlung chem. chem.-tech. Vorträge 27: 465-468 (1924).

NIGGLI, P. Krystallographische und strukturtheoretische Grundbegriffe. Leipzig, Akad. Verlagsges., 1928. 317 p. Bibl. at end of each chapter.

RINNE, FRIEDRICH. Bemerkungen und röntgenographische Erfahrungen ueber die Umgestaltung und den Zerfall von Kristallstrukturen. Z. Kristall. 59: 230-248 (1924). Bibl. footnotes.

WYCKOFF, R. W. G. X-Ray diffraction data from crystals and liquids. International critical tables I: 352-353 (1926). 402 references.

See also X-RAYS.

CRYSTALLIZATION: Velocity.*

BURGER, H. C. Velocity of crystallization. International critical tables V: 61-62 (1929). 54 references.

CRYSTALLOGRAPHY

Cristallographie et minéralogie. *In* Tables annuelles V: 1286-1401 (1917-1922); VI: 1226-1278 (1923-1926).

EVANS, R. U. The external form of crystals. Chemistry and Industry 44: 790-794, 812-815 (1925). 25 footnotes.

HONESS, ARTHUR P. The nature, origin and interpretation of the etch figures on crystals. N. Y., Wiley, 1927. 171 p. Bibl. footnotes.

MIERS, HENRY A. Growth of crystals in supersaturated liquids. J. Inst. Metals 37: 349-350 (1927). 70 references.

SCHAEFER, CLEMENS. Die Eigenschwingungen der Kristalle. Fort-

schritte Mineral. Krist. Petr. 9: 65-66 (1924). 33 references.

SCHIEBOLD, E. Die Drehkristallmethode. Fortschritte Mineral. Krist. Petr. 11: 274-280 (1927). 134 references.

SMEKAL, ADOLF. Zur Molekulartheorie der Festigkeit und der Verfestigung. Physik. Z. 27: 837-844 (1926). Bibl. footnotes.

STEINMETZ, H. Die chemisch-kristallographische Verwandtschaft. Fortschritte Mineral. Krist. Petr. 9: 29-30 (1924). 50 references.

TUTTON, ALFRED E. H. Crystalline form and chemical constitution. London, Macmillan, 1926. 252 p. Bibl., p. 240-241.

VALETON, J. J. P. Wachstum und Auflösung der Kristalle. Z. Krystall. 59: 135-169, 335-365 (1924). Bibl. footnotes.

ZAMBONINI, F. Ueber die Mischkristalle, welche die Verbindungen des Calciums, Strontiums, Bariums und Bleis mit jenen der seltenen Erden bilden. Z. Krystall. 58: 226-292 (1923). Bibl. footnotes.

CRYSTALS, LIQUID. See LIQUID CRYSTALS.

CYANIDE

BERTELSMANN, W., and SCHUSTER, F. Zusammenstellung der D. R. P. über Cyanverbindungen. In Ullmann's Enzyk. tech. Chem., 2nd ed., 3: 501-506 (1929). Classified.

BRUN, PAUL. L'industrie des cyanures. Paris, Doin, 1925. 469 p. Bibl., p. 449-460.

CYANIDE PROCESS

GROSS, J., and SCOTT, J. W. Precipitation of gold and silver from cyanide solution on charcoal. U. S. Bur. Mines, Tech. Paper No. 378. 1927. 78 p. Bibl., p. 73-78. 101 references.

CYANITE.* See ALUMINUM SILICATES.

CYANO COMPOUNDS *

ROSENMUND, KRAL W. Cyan-, Isocyan-, Oxycyan-, Thiocyan-, and Selenocyangruppe. In Houben-Weyl, Meth. org. Chem. 2nd ed., IV: 1-37 (1924). Bibl. footnotes.

CYANOSIS *

LUNDGAARD, CHRISTEN, and VAN SLYKE, DONALD D. Cyanosis. Medicine 2: 68-76 (1923). About 175 references.

CYMENE

AUSTERWEIL, G. Le *p*-cymène: Sa production, ses possibilités comme matière première dans l'industrie chimique. Chimie et industrie Spec. No., April, 1928: 568. 93 footnotes.

CYSTEINE

SULLIVAN, MICHAEL X. A distinctive test for cysteine. Reprint no. 1084 from the Public Health Reports 41: 1030-1056 (1926). 28 p. References, p. 27-28.

CYSTINE

GEGENHEIMER, VIDA. Studies on the quantitative estimation of the cystine content of casein. Thesis, Columbia University, 1925. 25 p. Bibl., p. 24-25.

See also AMINO ACIDS.

DAIRY PRODUCTS

BOISSE, PIERRE. L'industrie laitière et beurrière des Charentes et du Poitou. Thèse, Univ. de Toulouse, 1925. 64 p. Bibl. at end of chapters.

Fundamentals of dairy science. By associates of Lore A. Rogers in the Research Laboratories of the Bureau of Dairy Industry, U. S. Dept. of Agriculture. N. Y., Chem. Cat. Co., 1928. 528 p. More than 1300 references.

HAMMER, BERNARD W. Dairy bacteriology. N. Y., Wiley, 1928. 473 p. Bibl. footnotes.

HOLM, GEORGE E. Chemistry and the dairy industry. Ind. Eng. Chem. 20: 1315 (1928). 22 references.

LEVINE, MAX, and SOPPELAND, LULU. Bacteria in creamery wastes. Bull. 77, Iowa Eng. Expt. Sta. 1926. 72 p. Bibl., p. 70-72.

LICHTENBERGER, BERTHOLD. Die Milchindustrie der Vereinigten Staaten von Amerika, unter besonderer Berücksichtigung ihrer maschinentechnischen Hilfsmittel. Hildesheim, Molkerei-Zeitung, 1926. 275 p. Bibl., p. 272-274.

MOJONNIER, TIMOTHY, and TROY, HUGH C. The technical control of dairy products; a treatise on the testing, analysing, standardizing and the manufacture of dairy products. 2nd ed. Chicago, Mojonnier, 1925. 936 p. References at end of some of the chapters.

PALMER, LEROY SHELDON. Laboratory experiments in dairy chemistry. N. Y., Wiley, 1926. 84 p. References, p. 57-68.

PIQUE, R. Les produits de la laiterie chez les peuples anciens. Chimie et industrie, Special no., Feb., 1929: 667-668. 119 references.

SHERFY, CARRIE B. Partial list of publications on dairying issued in the United States, 1900 to June, 1923. U. S. Dept. Agr., Bibl. Contr. no. 6. 236 p. Aug., 1923. Mimeographed.

See also BUTTER; CHEESE; MILK; ETC.

DECOLORIZING AGENTS *

SINGER, LEOPOLD. Methoden der Wiederbelebung von organischen Entfärbungspulvern. *Chem.-Ztg.* 50:4-5, 57-58, 64-65, 74-76 (1926). 74 references.

See also CARBON: ACTIVATED; FULLER'S EARTH.

DEHYDROTHIOTOLUIDINE

ALLEN, ROGER W. New isomers of dehydrothio-*p*-toluidine. Further relationships between chemical constitution and color among thiazole dyes. Thesis, Columbia University, 1927. 38 p. Bibl., p. 37-38.

DENSITY

BAXTER, G. P. Density and thermal expansion of inorganic compounds in the liquid (including vitreous) state under one atmosphere. *International critical tables* III:24 (1928). 95 references.

BEARCE, H. W., MULLIGAN, GRACE C., and MASLIN, MERRIEL P. Density of certain aqueous organic solutions. *International critical tables* III:124-125 (1928). 121 references.

BRUNEL, ROGER F., and VAN BIBBER, KATHERINE. Density and thermal expansion of liquid organic compounds under atmospheric pressure. *International critical tables* III:34-35 (1928). 287 references.

CLARKE, J. R. Density and thermal expansion of chemical compounds in the crystalline state under atmospheric pressure. *International critical tables* III:45 (1928). 57 references.

CRENSHAW, J. L. Densities (specific gravities) and thermal expansion of aqueous solutions of organic compounds. *International critical tables* III:115 (1928). 144 references.

Densités. *In* *Tables annuelles* V:20-49 (1917-1922); VI:25-54 (1923-1926).

Density of the metallic elements. *International critical tables* II:457 (1927). 104 references.

GILLESPIE, L. J., *et al.* Density (specific gravity) and thermal expansion (under atmospheric pressure) of aqueous solutions of inorganic substances and of strong electrolytes. *International critical tables* III:108-111 (1928). 672 references.

HARING, MALCOLM M. Density and thermal expansion of homogeneous non-aqueous mixtures in the liquid or crystalline state (non-aqueous liquid or solid solutions). *International critical tables* III:197-198 (1928). 362 references.

PICKERING, S. F. P-V-T relations in the gaseous state for substances

which are gases at 0° and 1 atm. *International critical tables* III:16 (1928). 156 references.

PORTER, A. W. Density and thermal expansion of non-metallic elementary substances under atmospheric pressure. *International critical tables* III:22 (1928). 85 references.

DESMOTROPY

SCHMIDT, JULIUS. Methoden zur Untersuchung auf dem Gebiete der Tautomerie und Desmotropie. *In* *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 1:291-462 (1925). Bibl. footnotes.

DETERGENTS *

MARTIN, GEOFFREY. The modern soap and detergent industry, including glycerol manufacture. 3 vols. London, Lockwood, 1924-1925. Includes modern patents and literature.

VAIL, JAMES G. Deflocculation and detergency. *In his* *Soluble silicates in industry*, 1928, p. 300-353. 190 footnotes.

See also SOAPS; SODIUM SILICATE.

DEXTRIN. See STARCH.**DIABETES**

CAMMIDGE, PERCY J., and HOWARD, H. A. H. New views on diabetes mellitus. London, Frowde; Hodder & Stoughton, 1923. 611 p. Bibl. at end of each chapter.

COLWELL, A. R. The relation of the hypophysis to diabetes mellitus. *Medicine* 6:35-39 (1927). 150 references.

DEUEL, HARRY J., WILSON, ELLIS C., and MILHORAT, ADOLPH T. Mechanism of phlorhizin diabetes. *J. Biol. Chem.* 74:296-297 (1927). 34 references.

GEELMUYDEN, H. CHR. Die Hyperlipämie beim Diabetes mellitus des Menschen. *Ergeb. Physiol.* 26:1-7 (1928).

GEELMUYDEN, H. CHR. Ueber die spezifisch-dynamische Wirkung der Nahrungsstoffe und ihre Beziehungen zum Grundumsatz beim Diabetes mellitus. *Ergeb. Physiol.* 24:1-2 (1925).

JOSLIN, ELLIOTT P. The treatment of diabetes mellitus. 4th ed. Philadelphia, Lea & Febiger, 1928. 998 p. Bibl. footnotes.

MOTZFELDT, KETIL. Studier over diabetes insipidus. Kristiania, Steenske boktrykkeri, 1924. 111 p. Bibl. p. 94-111.

NASH, THOMAS P., JR. Phlorhizin diabetes. *Physiol. Rev.* 7:424-430 (1927). 223 references.

NOORDEN, KARL H. v., and ISAAC, S. Die Zuckerkrankheit und ihre Be-

handlung. 8 Aufl. Berlin, Springer, 1927. 627 p. Bibl., p. 558-616.

STAMMERS, ARTHUR D. A review of recent advances in the study of blood sugar and diabetes. *Physiol. Rev.* 6: 675-682 (1926). 300 references.

WOLFF, P. Zuckerersatzmittel und Insulinerersatzmittel in der Behandlung des Diabetes mellitus. *Arch. pharm.* 266: 242-244 (1928). Zuckerersatzmittel, p. 242; 52 references. Synthalin (German only), p. 243; 54 references. Glukhormont, p. 244; 15 references.

See also INSULIN.

DIALYSIS *

DIÉRE, CHARLES. Die Elektrodialyse in der Biochemie. *Kolloid-Z.* 41: 243-258 (1927). 67 references.

DIÉRE, CHARLES. La dialyse électrique (ou électrodialyse) en biochimie. *Bull. soc. chim. biol.* 8: 156-159, 604-610 (1926). 70 references.

REITSTOTTER, JOSEF. Die Elektrodialyse in der Biochemie. *Kolloid-Z.* 43: 35-41 (1927). 36 references.

RHEINOLDT, H. Dialyse und Ultrafiltration. In Houben-Weyl, *Meth. org. Chem.*, 3rd ed., I: 465-506 (1925). Bibl. footnotes.

RHEINOLDT, H. Methoden der Dialyse und Ultrafiltration. *Kolloid-Z.* 37: 387-397 (1925). 84 references.

See also DIFFUSION.

DIAMONDS

WAGNER, PERCY A. The diamond fields of South Africa. Johannesburg, 1914. 346 p. 255 references. Bibl., p. xvii-xxv.

DIASTASE

ADAMS, MILDRED. A quantitative comparison of the influence of neutral salts on the activity of pancreatic amylase and some of the factors involved. Thesis, Columbia University, 1927. 43 p. Bibl., p. 42-43.

FLEURY, P. La mesure de l'activité d'une préparation diastatique et les lois d'action des diastases. *J. pharm. chim.* 29: 278-284, 325-334 (1924). 24 references.

FUNKE, GEORGE L. Onderzoekingen over de vorming van diastase door *Aspergillus niger* Van Tiegh. Proefschrift, Utrecht, 1922. 77 p. Bibl., p. 59-61.

RAUTH, JOHN W. Diastatic activity of the blood serum in mental disorders. Thesis, Catholic Univ. of America, 1926. 32 p. Bibl., p. 28-29.

WOOD, WINIFRED J. Studies in the velocity of inactivation of malt

amylase. Thesis, Columbia University, 1927. 29 p. Bibl., p. 28-29.

See also AMYLASE; ENZYMES.

DIATOMACEOUS EARTH

DAVIS, C. W. Diatomaceous earth, with special reference to Nevada. U. S. Bur. Mines, Reports of Investigations No. 2718. 1925. 14 p. Bibl., p. 12-14.

EARDLEY-WILMOT, V. L. Diatomite, its occurrence, preparation and uses. Canada, Dept. Mines, Mines Branch, no. 691. 1928. 182 p. Bibl., p. 143-151. Classified.

PELLETAN, JULES. Les diatomées. Histoire naturelle, préparation, classification & description des principales espèces. Paris, Journal de micrographie, 1888-1889. "Bibl. des diatomées," vol. ii, p. 200-350, "principales publ. périodiques," vol. ii, p. 351-352.

See also SAND (Wiegel).

DIAZO COMPOUNDS

CONTARDI, A. Reazioni dei sali di diazonio coi composti di rame al massimo. *Ann. chim. appl.* 13: 13-26 (1923). 43 footnotes.

EDLBACHER, SIEGFRIED. Diazotieren. In Abderhalden, *Handb. Arbeitsm.* 1, pt. 2, 1st half: 457-462 (1927). 12 footnotes.

GERNGROSS, OTTO. Diazo-, Azo-, Azoxy- und Hydrazogruppe. In Houben-Weyl, *Meth. org. Chem.* 4: 590-719 (1924). Bibl. footnotes.

DIELECTRICS

BLÜH, O. Neuere Ergebnisse auf dem Gebiete der Dielektrizitätskonstanten. *Phys. Z.* 27: 266-267 (1926). 172 references.

BÜLTEMANN, AUGUST. Dielektrisches Material, Beeinflussung durch elektrisches Feld, Eigenschaften, Prüfung, Herstellung. Berlin, Springer, 1926. 160 p. Bibl., p. 151-160.

BUSH, V., and MOON, P. H. Precision measurement of puncture voltage. *Trans. Am. Inst. Elec. Eng.* 46: 1034-1035 (1927). 53 references.

COURSEY, PHILIP R. Electrical condensers. N. Y., Pitman, 1927. 637 p. Bibl. of 2,000 references.

CURTIS, HARVEY L. The electrical resistivity of insulating materials. *Trans. Am. Inst. Elec. Eng.* 46: 1046-1047 (1927). 74 references.

CURTIS, H. L., and DEFENDORF, F. M. Dielectric constant and dielectric strength of elementary substances, pure inorganic compounds and air. International critical tables VI: 80-81 (1929). 158 references.

DIELECTRICS—Cont'd

- DEL MAR, W. A., DAVIDSON, W. F., and MARVIN, R. H. Electric strength of solid and liquid dielectrics. *Trans. Am. Inst. Elec. Eng.* 46: 1061-1062 (1927). 80 references.
- EBERT, LUDWIG. Zur Bedeutung der dielektrischen Polarisation in reinen Stoffen und Mischungen. *Z. physik. Chem.* 113: 1-27 (1924). Bibl. footnotes.
- FÜRTH, REINHOLD, and BLÜH, OTTO. Die Dielektrizitätskonstante des V_2O_5 -Sols. *Kolloid-Z.* 34: 259-262 (1924). 24 footnotes.
- FYFE, A. W., JR. Insulating oils, a list of references (1900-1925). New York Pub. Lib., Bull. 30: 892-907, 935-988 (1926). Also as a separate of 71 p. 1927.
- GILBERT, L. F. Notes on the dielectric constants of liquids. *Science Progress* 21: 57-73 (1926). Bibl. footnotes.
- GRAETZ, L. Eigenschaften der Dielektrika. In Winkelmänn, Handb. der Physik, 2nd ed., 4, pt. 1: 77-171 (1903). Extensive bibl. footnotes, covering up to June, 1902.
- GÜNTHER-SCHULZE, A. Die dielektrische Festigkeit von Flüssigkeiten und festen Körpern. *Jahrb. Radioakt. Elektronik* 22: 111-112 (1922). 24 references.
- HAFNER, E. A. Biologie und Dielektrizitätskonstante. *Ergeb. Physiol.* 24: 566-568 (1925). 98 references.
- HARTSHORN, *et al.* Dielectric constant and dielectric strength of single crystals, mixtures and solutions, pure organic compounds and miscellaneous materials. *International critical tables* VI: 106-107 (1929). 200 references.
- LICHTENECKER, K. Die Dielektrizitätskonstanten natürlicher und künstlicher Mischkörper. *Phys. Z.* 27: 156-158 (1926). 116 references.
- MALTI, MICHEL G. Solid dielectrics. Thesis, Cornell University, 1927. 17 p. Bibl., p. 16-17.
- RAYNER, E. H. High voltage tests and energy losses in insulating materials. *J. Inst. Elec. Eng.* 49: 53-71 (1912).
- SMEKAL, ADOLF. Elektrizitätsleitung und dielektrische Festigkeit isolierender Ionenkristalle. *Z. tech. Physik* 8: 561-586 (1927). 111 footnotes.
- WALDEN, P., and ULLICH, H. Der heutige Stand unserer Kenntnisse von den Dielektrizitätskonstanten der wässrigen und nichtwässrigen Elektrolytlösungen. *Z. physik. Chem.* 110: 43-56 (1924). Bibl. footnotes.
- WHITEHEAD, JOHN B. Dielectric absorption and theories of dielectric behavior. *Trans. Am. Inst. Elec. Eng.* 45: 120-124 (1926). 350 references.
- WHITEHEAD, JOHN B. Lectures on dielectric theory and insulation. N. Y., McGraw-Hill, 1927. 154 p. Bibl. by subject, p. 141-150.
- WHITEHEAD, S. Dielectric phenomena; electrical discharges in gases. London, Benn, 1927. 175 p. Alphabetical bibl., p. 171-174.
- WHITEHEAD, S. Dielectric phenomena. II. Electrical discharge in liquids. London, Benn, 1928. 137 p.

DIET

BOHSTDET, G., *et al.* Mineral and vitamin requirements of pigs. *Ohio Agr. Expt. Sta., Bull.* 395: 227-229 (1926).

ECKLES, C. H., *et al.* Mineral deficiency in the rations of cattle. *Minn. Agr. Expt. Sta., Bull.* 229: 47-49 (1926).

SANSUM, WILLIAM D. The normal diet; a simple statement of the fundamental principles of diet for the mutual use of physicians and patients. 2nd ed. St. Louis, Mosby, 1927. 136 p. References at end of most of the chapters.

See also FOODS; METABOLISM; NUTRITION; ETC.

DIETHYLBARBITURIC ACID.

DOHRN, M. Diethylbarbitursäure. In *Ullmann's Enzyk. tech. Chem.*, 2nd ed., 3: 656-657 (1929). Bibl. of German patents for synthesis.

DIFFUSION

ADOLPH, EDWARD F. Electrostatic forces in the diffusion of water through collodion membranes between solutions of mixed electrolytes. *J. Biol. Chem.* 64: 366-368 (1925). 59 references.

BOYNTON, W. P., and BRATTAIN, W. H. Interdiffusion of gases and vapors. *International critical tables* V: 63 (1929). 25 references.

BRUINS, H. R. Coefficient of diffusion in liquids. *International critical tables* 5: 75-76 (1929). 151 references.

Diffusion. In *Tables annuelles* V: 875-881 (1917-1923); VI: 840-845 (1923-1926).

See also COLLOIDS; DIALYSIS.

DIGESTION

BABKIN, B. P. The digestive work of the stomach. *Physiol. Rev.* 8: 385-392 (1928). 131 references.

GRAYZEL, DAVID M. The hydrogen-ion concentration of the intestinal contents under various conditions, with special reference to rickets. Thesis,

Columbia University, 1927. 21 p. Bibl., p. 19-21.

WOKER, G. Methoden zum Studium der Wirkung der einzelnen Verdauungssäfte. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 6: 1216-1706 (1928). Bibl. footnotes.

See also INTESTINE; METABOLISM.

DIGITALIS

CUSHNY, ARTHUR R. Action and uses in medicine of digitalis and its allies. N. Y., Longmans, 1925. 303 p. Bibl. of 559 references.

GOLD, HARRY. Digitalis elimination. Arch. Internal Med. 32: 779-795 (1923). 28 footnotes.

KNAFFL-LENZ, ERIK. Physiological assay of digitalis. J. Pharmacol. 29: 422-425 (1926). 135 references.

SCHMOLKE, ARTHUR. *Folia digitalis* und die Präparate daraus. Dresden, Schwarzeck-Verlag, G. m. b. H., 1925. 97 p. Bibl., p. 67-93.

SWANSON, E. E., and HARGRAVES, C. C. The standardization of digitalis preparations. J. Am. Pharm. Assoc. 17: 644 (1928). 44 references.

See also ALKALOIDS.

DIMETHYLENIMINES *

HOLLINS, C. Dimethylenimines. In his Synthesis of nitrogen ring compounds, p. 17-21. London, Benn, 1924. Bibl. and footnotes.

DIOPSIDE. See MAGNESIUM SILICATES.

DISINFECTANTS

KOCH, DOROTHY A. An experimental study of the effects of dyes, of dye mixtures and of disinfectants upon *Endamoeba gingivalis* (Gros) *in vitro*. University of California Publs. in Zoology, 29, no. 11: 264-266 (1926).

MILLS, R. G., BARTLETT, C. L., and KESSEL, J. F. Penetration of fruit and vegetables by bacteria and other particulate matter and the resistance of bacteria, protozoan cysts and helminth ova to common disinfection methods. Am. J. Hygiene 5: 559-579 (1925). 57 references.

WEISS, JOSEF. Desinfektionsversuche mit Chloramin-Heyden und Serapid bei Maul- und Klauenseuche. Inaug.-Diss., Tierärztl. Hochschule, Hannover, 1925. 46 p. Bibl., p. 43-45.

See also ANTISEPTICS; IODINE.

DISSOCIATION

BORN, FRITZ. Ueber die Dissoziation einiger Metalloxyde. Z. Elektrochem. 31: 309-311 (1925). Bibl. in table.

HALBAN, H. v., and ZIMPELMANN, E. Ueber die Dissoziationskonstanten organischer Molekülverbindungen. Z.

physik. Chem. 117: 461-477 (1925). Bibl. footnotes.

THRELFALL, R. Dissociation. In Watt's Dictionary of chemistry, rev. ed., vol. 2: 410-412 (1912). 83 references. See also ELECTROLYTIC DISSOCIATION.

DISTILLATION

BARBAUDY, JEAN. Contribution à l'étude de la distillation des mélanges ternaires hétérogènes. These, Univ. Paris, 1925. 155 p. 102 footnotes.

HANSEN, CHRISTIAN J. Destillation. In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 581-662 (1925). Bibl. footnotes.

HAUSBRAND, EUGEN. Principles and practice of industrial distillation. London, Chapman & Hall, 1925. 300 p. Bibl. of recent papers, p. xix-xx.

ÖMAN, ERIK. Destillation och destillationsapparater. Stockholm, Teknologernas handelsförening, 1924. 106 p. Bibl., p. 94-104.

See also VAPOR PRESSURE.

DISTRIBUTION COEFFICIENT *

FORBES, GEORGE S., and ANDERSON, G. W. Phase equilibrium data for condensed systems containing two liquid phases with a third component in distribution equilibrium between them, the two liquid phases being practically non-miscible. Distribution coefficients. International critical tables III: 434-435 (1928). 180 references.

DRUGS

ARNY, H. V. The evolution of synthetic medicinal chemicals. Ind. Eng. Chem. 18: 951-952 (1926). 96 references.

FOURNEAU, ERNEST. Organic medicaments and their preparation. London, Churchill, 1925. 262 p. Bibl., p. 256-257.

HANZLIK, P. J. Actions and use of the salicylates and cinchophen in medicine. Medicine 5: 357-373 (1926). About 700 references.

JENSEN, HERMAN H. Experimental study of certain benzyl compounds with especial attention to the importance of substitution in the benzyl nucleus and the significance of the side chain. J. Pharmacol. 26: 167-169 (1925). 56 references.

MAYRHOFER, ADOLF. Mikrochemie der Arzneimittel und Gifte, die offizinellen anorganischen und organischen Säuren und ihre Salze. Berlin, Urban & Schwarzenberg, 1923. 284 p. Bibl., p. 275.

OEHLI, HANS A. Ueber quantitative Mikrosublimation von Coffein und Theobromin und die Alkaloidbestimmung bei Purindrogen. Promotionsar-

DRUGS—Cont'd

beit, Tech. Hochschule, Zurich, 1923. 83 p. Bibl., p. 80-83.

PAUL, A. E. Sampling drugs. J. Assoc. Off. Agr. Chem. 10:99-102 (1927). 11 references.

PITTINGER, PAUL S. A text-book of biologic assays. Philadelphia, Blakiston's, 1928. 373 p. Bibl., p. 355-358.

RABOW, S. Uebersicht der im Laufe des Jahres 1924 bekannt gewordenen therapeutischen Neuheiten einschliesslich der Spezialitäten und Geheimmittel. Chem.-Ztg. 49:265-266, 301-302, 338-339, 361-363 (1925). 190 footnotes. 1928. Fortschrittber. Chem.-Ztg. no. 1:33-37 (1929). 162 footnotes.

SPIEGEL, LEOPOLD J. Heilmittel und Gifte im Lichte der Chemie. Stuttgart, Enke, 1923. 131 p. Bibl. footnotes.

WILLNER, OTTO. Remedies recently introduced in the therapy of amoebiasis. Medicine 6:366-374 (1927). 150 references.

YOUNGKEN, H. W. The drugs of the North American Indian. II. Am. J. Pharm. 97:270-271 (1925). 28 references.

DRYING

ALLIOTT, EUSTACE A. Centrifugal dryers and separators. London, Benn, 1926. 151 p. Bibl., p. 142-143.

ALLIOTT, EUSTACE A. Drying and drying plant. Trans. Inst. Chem. Eng. 2:93-110 (1924). 400 references, arranged by magazines. Subject index.

HIRSCH, MORITZ. Die Trockentechnik; Grundlagen, Berechnung, Ausführung, und Betrieb der Trockeneinrichtungen. 1927. Contains bibl. footnotes.

STEINKOPF, WILHELM. Das Trocknen. In Houben-Weyl, Meth. org. Chem., 3rd ed., I:363-398 (1925). Bibl. footnotes.

DUSTS

BEYERSDORFER, PAUL. Staub-Explosionen. Dresden, Steinkopff, 1925. 125 p. Bibl. at end of chapters.

MELDAU, ROBERT. Der Industriestaub; Wesen und Bekämpfung. Berlin, V. D. I.-Verlag, 1926. 301 p. Bibl., p. 292-298.

DYES AND DYEING

AMBLER, JOSEPH A., *et al.* Chemistry and analysis of the permitted coal-tar food dyes. U. S. Dept. of Agriculture, Dept. Bull. 1390. 40 p. Bibl., p. 35-39.

COHN, W. A. Die Literaturkartei im Dienste des Lack und Farbenchemikers. Farben-Ztg. 33:2545-2547 (1928).

CURTIS, C. A. Künstliche organische Pigmentfarben und ihre Anwendungsgebiete. Berlin, Springer, 1929. 230 p. Contains lists of patents.

DOYLE, AIDA M. Digest of patents relating to coal-tar dyes and allied compounds. U. S. patents issued prior to Jan. 1, 1924. Easton, Chem. Pub. Co., 1926. 585 p. Arranged by groups of dyes, each patent being abstracted. Color, intermediate, patentee and Schulz index.

ELÖD, EGON. Physikalisch-chemische Beiträge zur Theorie der mineralischen Beizung tierischer Faserstoffe. Kolloidchem. Beihefte 19:298-362 (1924). Bibl. footnotes.

FIERZ-DAVID, H. E. Künstliche organische Farbstoffe. Berlin, Springer, 1926. 719 p. Bibl. footnotes. Patent indexes.

FRIEDLÄNDER, P. Fortschritte der Teerfarbenfabrikation und verwandter Industriezweige. Berlin, Springer, 1926. Vols. XIV-XV cover patents from July 1, 1921, to 1927.

GILIG, E., SCHÜRHOFF, P. N., and Hofmann, R. Farbstoffe. In Wiesner, Rohstoffe des Pflanzenreiches I:386-389 (1927). 325 references.

GREENSBURG, IRVING W. Further studies in the "Pechmann dyes" group: the reaction of "Pechmann dyes" with ammonia and amines, and correlated observations. Thesis, Columbia University, 1926. 40 p. Bibl., p. 38-40.

HALLER, R. Die Entwicklung der Faerberei und Druckerei in den letzten 10 Jahren. Z. angew. Chem. 41:121-127 (1928). 75 footnotes.

HALLER, R., and NOWAK, A. Kolloidchemische Untersuchung als Grundlage für die Theorie der Baumwollfärbungen. Kolloidchem. Beihefte 13:61-136 (1920). Bibl. footnotes.

HEERMANN, P. Faerberei und textilchemische Untersuchungen. 4th ed. Berlin, Springer, 1923. 370 p. Bibl. footnotes.

HORSFALL, R. S., and LAWRIE, L. G. The dyeing of textile fibres. London, Benn, 1927. 415 p. Bibl. of 185 titles, p. 393-398.

MARTINET, JOSEPH. Matières colorantes. L'indigo et ses dérivés. Paris, Baillière, 1926. 700 p. Bibl. at end of chapters.

MAYER, FRITZ. Die Fortschritte der Farbstoffchemie. 1924. Chem.-Ztg. 49:949-951, 970-972, 985-987, 1001-1003, 1025-1026, 1029-1030 (1925). 128 footnotes. 1925. *Ibid.* 50:467-468, 514-516, 565-567, 587-588 (1926); 78 footnotes. 1926. Fortschrittber. Chem.-Ztg. no. 2:52-65 (1927); 157

- footnotes. 1927. *Ibid.* no. 2: 52-68 (1928); 208 footnotes.
- MEYER, KURT H. Zur Physik und Chemie der Färbvorgänge. *Naturwissenschaften* 15:134 (1927). 20 references.
- MULLIN, CHARLES E. Acetate silk and its dyes. N. Y., Van Nostrand, 1927. 473 p. References at end of most of the chapters.
- RHEINBOLDT, H., and WEDEKIND, E. Ueber die Bindung organischer Farbstoffe durch anorganische Substrate. *Kolloidchem. Beihefte* 17:115-188 (1923). Bibl. footnotes.
- SCHNEIDER, FELIX. Die Erkennung des Farbstoffcharacters. In Houben-Weyl, *Meth. org. Chem.*, 3rd ed., I: 1207-1278 (1925). Bibl. footnotes.
- SCHULTZ, J. Farbstofftabellen. 6th ed. Berlin, Wiedmann, 1923. Bibl., p. 272-281.
- SOCIETY OF CHEMICAL INDUSTRY. Colouring matters and dyes. In Reports of the progress of applied chemistry 10:97-136 (1925); 249 footnotes. 11:87-116 (1926); 266 footnotes. 12:87-119 (1927); 273 footnotes. 13:109-136 (1928); 254 footnotes.
- STERN, ERNST. Farbenbindemittel. In Liesegang, *Kolloidchem. Tech.*, 322-371 (1927). Bibl. footnotes.
- SUEVERN, —. Neueste Patente auf dem Gebiete der künstlichen organischen Farbstoffe. *Färber-Ztg.* 25:97, 121, 244, 373, 388, 397, 442 (1924); 26:7, 22, 60, 75, 163, 239, 272 (1915); 27:37, 100, 148, 245, 293 (1916); 28:7, 87 (1917); 29:13, 98, 217 (1918); 30:53, 113, 173, 185, 261 (1919).
- WAHL, A. Les matières colorantes. In Dix ans d'efforts scientifiques et industriels, p. 570-606 (Paris, Chimie et industrie). Bibl. footnotes.
- WOLFF, HANS, and SCHLICK, W. Farben und Lackkalender. 1925. Bibl., p. 219-221.
- WOOD, JOHN K. The chemistry of dyeing. New and rev. ed. London, Gurney & Jackson, 1926. 104 p. Bibl., p. 99-102.
- ZSIGMONDY, R. Ueber den Zerteilungsstand hochmolekularer Farbstoffe in wässerigen Lösungen. *Z. physik. Chem.* 111:211-233 (1924). Bibl. footnotes.
- See also STAINS.
- DYES: Testing.**
- HADFIELD, ISABEL H. Light sources for testing the fastness of dyes. *J. Text. Inst.* 18:558T (1927). 63 references.
- DYSPNOEA.***
- MEANS, JAMES H. Dyspnoea. *Medicine* 3:406-416 (1924). About 200 references.
- EBONY***
- FISCHER, EMIL J. Das Ebenholz und seine Ersatzmittel. *Kunststoffe* 14:182-183 (1924). 24 patents on substitutes.
- EDEMA**
- ELWYN, HERMAN. Edema and its treatment. N. Y., Macmillan, 1929. 182 p. Bibl., p. 161-173.
- FISCHER, MARTIN H. Kolloidchemie der Wasserbindung; eine kritische und experimentelle Untersuchung der Wasserbindung in Kolloiden und ihrer Beziehungen zu den Problemen der Wasserbindung in Physiologie, Medizin und Technik. 2 Aufl. Dresden, 1927-28. 2 v. Bibl., 2:278-280.
- LE CALVÉ, JULES YVES MARIE. L'œdème: étude expérimentale et clinique. Paris, Masson, 1925. 648 p. Bibl. footnotes.
- LOEB, LEO. Edema. *Medicine* 2:325-348 (1923). About 500 references.
- Lungs, edema of. *Index.-Cat.*, S. G. O., 3rd ser., 7:819-820 (1928).
- MCLEAN, FRANKLIN C. Edema, as a problem in physiological regulation. *Physiol. Rev.* 5:638-640 (1925). 56 references.
- EFFLORESCENCE.*** See SCUMMING.
- EGGS**
- Eggs. *Index.-Cat.* S. G. O., 3rd ser., 5:141-143 (1925). Includes chemistry and preservation.
- PAECHTNER, J. Chemie der Eier. In Oppenheimer, *Handb. Biochem.* 4:680-713 (1924). 173 footnotes.
- ELASTICITY.** See COMPRESSIBILITY; CONCRETE.
- ELASTIN***
- Elastin. *Index.-Cat.* S. G. O., 3rd ser., 5:156 (1925). 11 references.
- ELECTRIC ARC***
- HAGENBACH, AUGUST. Der elektrische Lichtbogen. Leipzig, Akad. Verlags., 1924. 282 p. Bibl. footnotes.
- MAURICE, LEBLANC FILS. L'arc électrique. 1922. 131 p. 100 references.
- ELECTRIC BATTERIES***
- GÜNTHERSCHULZE, ADOLF. Galvanische Elemente. Halle, Knapp, 1928. 184 p. Bibl., p. 181-182.
- LEIDEL, E. Neuerungen auf dem Gebiete der galvanischen Elemente und Trockenbatterien. *Z. angew. Chem.* 42:307 (1929). 21 references.

ELECTRIC FURNACES

BORCHERS, W. Die elektrischen Oefen. 4th ed. Halle, Knapp, 1923. 238 p. Bibl. footnotes.

BYRNES, TOWNSEND and BRICKENSTEIN. Digest of electrochemical U. S. patents prior to 1903. Electric furnaces. Chem. Met. Eng. 6: 306-307, 345, 389, 434, 476, 523-524 (1908); 7: 49, 140, 176, 235-236, 293-294, 373, 459-460, 499 (1909); 8: 57, 168-169, 216-217, 305, 380, 553-554, 605-606 (1910).

LEBEAU, PAUL, Ed. Fours électriques et chimie. 1924. Contains bibl. footnotes.

NORTHROP, E. F. Results obtained with high frequency induction. Trans. Am. Inst. Chem. Eng. 12: 97-112 (1919). Bibl., p. 97-98.

RUSS, E. F. Die Elektrostahlöfen. München, Oldenbourg, 1924. 471 p. Bibl. footnotes.

See also ELECTRODES; ELECTROMETALLURGY; REFRACTORIES.

ELECTRIC INSULATION*

DEL MAR, W. A. Electric cables, their design, manufacture and use. New York, McGraw-Hill, 1924. 208 p. Bibl., p. 184-199.

DEMUTH, W. Die Materialprüfung der Isolierstoffe der Elektrotechnik. Berlin, Springer, 1923. 254 p. Bibl., p. 248-250.

FYFE, ARTHUR W., JR. Insulating oil, a list of references (1900-1925) in the New York Public Library. New York, The New York Public Library, 1927. 71 p. Reprinted from Bull. N. Y. Pub. Lib. 30: 892-907, 935-988 (1926).

MONKHOUSE, ALLAN. Electrical insulating materials; a complete treatise on the preparation, properties, and characteristics of the materials used for electrical insulation with a full description of the methods of testing. N. Y., Pitman, 1926. 392 p. Bibl., p. 383-385.

RETZOW, ULRICH. Die Eigenschaften elektrotechnischer Isoliermaterialien in graphischen Darstellungen; eine Sammlung von Versuchsergebnissen aus Technik und Wissenschaft. Berlin, Springer, 1927. 250 p. Bibl., p. 130-235, 241-250.

STÄGER, HANS. Die Kolloidchemie der Isoliermaterialien. In Liesegang, Kolloidchem. Tech., p. 264-307 (1927). Bibl. footnotes.

STÄGER, HANS. Elektrotechnische Isolierstoffe. Kolloid-Z. 46: 60-66 (1928). 74 footnotes.

TYPKE, —. Ueber die Veränderungen der Transformatorenöle. Z. angew.

Chem. 41: 148-153, 418-425 (1928). 213 footnotes.

VOGEL, WILHELM. Die neuere Entwicklung der Hochspannungs-Kabeltechnik. Z. tech. Physik 8: 488-489 (1927). 40 references.

WHITEHEAD, J. B., LAMPE, J. H., and FARMER, F. MALCOLM. Industrial electrical insulators. International critical tables II: 307, 311 (1927). 47 references.

See also DIELECTRICS.

ELECTRICAL CONDUCTIVITY

Conductibilité électrique. In Tables annuelles V: 754-766 (1917-1922); VI: 681-705 (1923-1926).

Conductibilité électrique des électrolytes. In Tables annuelles V: 1178-1214 (1917-1922); VI: 1092-1134 (1923-1926).

DRYSDALE, C. V. Electrical resistivity of alloys, amalgams and commercial metals. International critical tables VI: 201, 205-206 (1929). 306 references.

GRAETZ, L. Elektrische Leitfähigkeit von metallisch leitenden Körpern. In Winkelmann, Handb. der Physik, 2nd ed., 4, pt. 1: 342-384 (1903). Extensive bibl. footnotes, covering the literature up to Nov., 1902.

JANDER, W. Neuere Forschungen über Diffusion und elektrische Leitfähigkeit fester Salze. Z. angew. chem. 42: 466-467 (1929). 31 references.

KENDALL, JAMES. Electrical conductivity and ionization constants of weak electrolytes in aqueous solutions. International critical tables VI: 302-304 (1929). 637 references.

LOEB, LEONARD B. Properties of carriers of free electricity in gases. International critical tables VI: 117-119 (1929). 162 references.

MACKAY, G. M. J. Electrical resistivity of single crystals, solid poor conductors, mixtures of rare earth oxides and liquid mixtures suitable for high resistances. International critical tables VI: 155 (1929). 50 references.

MILLARD, E. B. Electrical conductivity of electrolytic conductors at high temperatures. International critical tables VI: 151 (1929). 68 references.

ONNES, H. K., and TUYN, W. Electrical resistance of elementary substances at temperatures below -80° C. International critical tables VI: 134-136 (1929); Comm., Phys. Lab. Univ. Leiden, Suppl. No. 58. 1926. 167 references.

PARTINGTON, J. R. Electrical conductivity of pure non-metallic liquids. International critical tables VI: 146 (1929). 135 references.

SMEKAL, ADOLF. Elektrizitätsleitung und dielektrische Festigkeit isolierender Ionenkristalle. *Z. tech. Physik* 8: 561-586 (1927). 111 footnotes.

ULICH, HERMANN. Ueber die Beweglichkeit der elektrolytischen Ionen. *Fortschritte Chem., Phys., physik. Chem.* 18, no. 10. 56 p. 1926. Bibl. footnotes.

WASHBURN, EDWARD W., KLEMENC, ALFONS, and PARKER, HENRY C. Electrical conductivity of salts and of all inorganic strong electrolytes. *International critical tables VI*: 255-256 (1929). 278 references.

WENNER, FRANK. Electrical resistivity of pure metals at temperatures below -80° C. *International critical tables VI*: 141 (1929). 83 references.

WEST, CLARENCE J. Electrolytic conductivity of aqueous solutions containing two solutes. *International critical tables VI*: 308-309 (1929). 115 references.

See also ELECTROCHEMISTRY; ELECTROLYTES.

ELECTRICAL PRECIPITATION

DEUTSCH, WALTHER. Elektrische Gasreinigung. *Z. tech. Physik* 6: 436-437 (1925). 40 references.

GIBBS, WM. E. Clouds and smokes. Philadelphia, Blakiston, 1924. 240 p. Bibls. at ends of chapters.

HANLEY, HERBERT R. Electrical precipitation as applied to gas streams. *School of Mines and Metallurgy, Univ. Mo., Bull., Tech. ser., v. 9, no. 2*. 1926. 64 p. Bibl., p. 64.

SEELIGER, R. Die physikalischen Grundlagen der elektrischen Gasreinigung. *Z. tech. Physik* 7: 49-71 (1926). Bibl. footnotes. Bibl., p. 70-71.

ELECTROCAPILLARITY*

FRUMKIN, A. Kapillarelektische Erscheinungen in nichtwässrigen Lösungsmitteln. *Z. physik. Chem.* 103: 43-54 (1923). Bibl. footnotes.

FRUMKIN, A. Zur Theorie der Elektrokapillarität. *Z. physik. Chem.* 103: 55-70 (1923). Bibl. footnotes.

WILD, H. Elektrokapillarkurven in nichtwässrigen Lösungen. *Z. physik. Chem.* 103: 1-38 (1923). Bibl. footnotes.

ELECTROCHEMISTRY

ARNDT, K. Elektrochemische Methoden. In *Houben-Weyl, Meth. org. Chem.*, 3rd ed., II: 1120-1139 (1925). Bibl. footnotes.

BROCKMANN, CHARLES J. Electroorganic chemistry. N. Y., Wiley, 1926. Contains bibl. footnotes. Bibl., p. ix-x.

Electrochemistry. Index-Cat. S. G. O., 3rd ser., 5: 166-167 (1925).

FINKELSTEIN, WLADIMIR. Zersetzungsspannung einiger nichtwässrigen Lösungen. *Z. physik. Chem.* 115: 303-308 (1925). Bibl. footnotes.

GILBERT, H. W., and SHAW, P. E. Electrical charges arising at a liquid-gas interface. *Proc. Phys. Soc. London* 37: 210-214 (1925). 90 references.

HARNED, HERBERT S. The electrochemistry of solutions of mixed electrolytes. *Trans. Am. Electrochem. Soc.* 51: 571-604 (1927). 42 footnotes.

MEINGAST, RUDOLF. Fortschritte der elektrochemischen Industrien in den Jahren 1920-1924. *Chem.-Ztg.* 49: 221-222, 313-314, 333-334, 377-378, 417-418, 461-462, 473-474, 497-499, 533-534, 554-556, 562, 578-579, 585-588, 606-607 (1925). 563 footnotes.

MEINGAST, RUDOLF. Fortschritte der elektrochemischen Industrie. *Fortschrittsber. Chem.-Ztg.*, no. 2: 29-52 (1928). 575 footnotes.

MÜLLER, FRIEDRICH. Fortschritte der Elektrochemie in den letzten zehn Jahren. *Z. angew. Chem.* 38: 766-771, 865-868, 933-941 (1925). 235 references.

MÜLLER, R. Elektrochemie der nichtwässrigen Lösungen. *Sammlung chem. chem.-tech. Vorträge* 27: 243-358 (1924). Bibl. footnotes. Bibls. through text.

SOCIETY OF CHEMICAL INDUSTRY. Electrochemical and electro-metallurgical industries. In *Reports of the progress of applied chemistry* 10: 276-309 (1925); 140 footnotes. 11: 281-311 (1926); 160 footnotes. 12: 283-321 (1927); 267 footnotes. 13: 312-351 (1928); 173 footnotes.

ELECTRODES

BILMANN, EINAR. L'électrode à quinquedrone et ses applications. *Bull. soc. chim.* 41: 282-286 (1927). 79 references.

ELLINGHAM, H. J. T., and ALLMAND, A. J. Irreversible electrode phenomena. *Trans. Faraday Soc.* 19: 748-771 (1924). 80 references, p. 770-771.

GOARD, ARTHUR K. The measurement of certain "inaccessible" potentials with a controlled oxygen electrode. *Trans. Faraday Soc.* 19: 740-747 (1924). Bibl. footnotes.

HUMFELD, HARRY, and ALBEN, A. O. Electrodialysis of soils. II. Choice of electrodes. *Am. J. Agron.* 20: 50 (1928). 20 references.

Les nouvelles applications pratiques de l'électrode à quinquedrone, des nouveaux indicateurs et du colorimètre a

ELECTRODES—Cont'd

deuilles de Wulff à la spectrophotométrie. *Chimie et industrie*, Special No., April, 1928: 773-774. 66 references.

MANTELL, CHARLES L. *Industrial carbon*. N. Y., Van Nostrand, 1928. 410 p. Bibl., p. 395-396.

RANDALL, MERLE, and YOUNG, L. E. The calomel and silver chloride electrodes in acid and neutral solutions. The activity coefficient of aqueous hydrochloric acid and the single potential of the deci-molal calomel electrode. *J. Am. Chem. Soc.* 50: 989-1004 (1928). 48 footnotes.

ZELLNER, J. Die Entwicklung der Kunstkohlenfabrikation. *Z. Elektrochem.* 7: 517-523 (1901). Bibl. footnotes.

ELECTROLYSIS

Electrolysis. Index-Cat. S. G. O., 3rd ser., 5: 168-170 (1925).

KREMAN, R. Elektrolyse geschmolzener Legierungen. *Samm. chem. und chem.-tech. Vorträge* 28: 347-408 (1926). About 50 references in footnotes.

See also ELECTROCHEMISTRY.

ELECTROLYTES

BILTZ, WILHELM, and KLEMM, WILHELM. Ueber einige Schmelzelektrolyte. *Z. physik. Chem.* 110: 318-342 (1924). Bibl. footnotes.

EBERT, LUDWIG. Neuere Forschung ueber die Anomalien starker Elektrolyte. *Jahrb. Radioakt. Elektronik* 21: 134-137 (1921). 105 references.

HARNED, HERBERT S., and AKERLOF, GÖSTA. Experimentelle Untersuchungen an wässrigen Lösungen einfacher gewöhnlicher Elektrolyte. *Physik. Z.* 27: 411-448 (1926). Bibl. footnotes.

HEYDWEILLER, A. Optische Untersuchungen an wässrigen Elektrolytlösungen. *Physik. Z.* 26: 556 (1925). 36 references.

See also ELECTRICAL CONDUCTIVITY; ELECTROCHEMISTRY.

ELECTROLYTIC DISSOCIATION

AUERBACH, FRIEDRICH. Die neuen Wandlungen der Theorie der elektrolytischen Dissoziation. *Ergeb. exakt. Naturwissenschaften* 1: 254-255 (1922). 17 references.

See also ELECTRICAL CONDUCTIVITY; ELECTROCHEMISTRY; ELECTRODES.

ELECTROMETALLURGY

BARTON, LARRY J. *Refining metals electrically*. Cleveland, Penton Publ. Co., 1926. 414 p. Bibl., p. 394-406.

DICKMANN, H. *Bibliographie über die Darstellung des Roheisens im elektrischen Ofen*, Ver. deut. Eisenhuettenleute. Duesseldorf, 1921. 191 references.

See also ELECTRIC FURNACE; ELECTROCHEMISTRY; METALLURGY; and various metals.

ELECTROMOTIVE FORCE

BRODSKY, A. E. Die elektromotorischen Kräfte und das Lösungsmittel. *Z. physik. Chem.* 121: 1-25 (1926). Bibl. footnotes.

CONANT, J. B. Electromotive force of cells involving the oxidation and reduction of organic compounds. *International critical tables* VI: 338 (1929). 38 references.

DRUCKER, C., and LUFT, F. Die elektromotorische Kraft von Calciumelektroden. *Z. physik. Chem.* 121: 307-329 (1926). Bibl. footnotes.

Force électromotrices. *In* *Tables annuelles* V: 1216-1261 (1917-1922); VI: 1135-1168 (1923-1926).

GERKE, ROSCOE H. Potentials of electrochemical reactions. *International critical tables* VI: 333 (1929). 87 references.

HARNED, H. S. The E. M. F. of concentration cells. *International critical tables* VI: 331 (1929). 184 references.

MACINNES, DUNCAN A. Liquid junction potentials. *International critical tables* VI: 339 (1929). 24 references.

SMYTH, CHARLES P. The potentials of electrode cells. *International critical tables* VI: 321 (1929). 103 references.

ELECTRONICS

Atomistique. Électronique. Ionisation. *In* *Tables annuelles* V: 805-820 (1917-1923); VI: 812-828 (1923-1926).

BOTHE, W. Durchgang korpuskularer Strahlen durch Materie und Konstitution der Atome. II. *Jahrb. Radioakt. Elektronik* 20: 46-84 (1923). Bibl. footnotes.

DAVEY, WHEELER P. The radii of atoms and electrons. *Chem. Reviews* 2: 367 (1926). 25 references.

FRANCK, JAMES, and JORDAN, P. *Anregung von Quantensprüngen durch Stöße*. Berlin, Springer, 1926. 312 p. Includes bibls.

HERZFELD, KARL F. Bericht über die Grösse der Moleküle, Atome und Ionen und die Methoden zu ihrer Bestimmung. *Jahrb. Radioakt. Elektronik* 22: 260-265 (1922). 153 references.

HUGGINS, MAURICE L. Atomic radii. *Phys. Rev.* 28: 1086-1107 (1926). 133 footnotes.

RODEBUSH, WORTH H. Thermal equilibrium of electrons in metals: Contact potentials and thermoelectric force. *Chem. Reviews* 4: 270 (1927). 22 references.

TOWNSEND, J. S. Motion of electrons in gases. *J. Franklin Inst.* 200: 563-590 (1925). Bibl. footnotes.

See also ATOMIC STRUCTURE.

ELECTROOSMOSIS

MAYER, ERWIN. Elektroosmose. In *Liesegang, Kolloidchem. Tech.* 94-136 (1927). Bibl. footnotes.

ELECTROPLATING

ENOS, GEORGE M. Notes on the plating of chromium on steel. *Trans. Am. Electrochem. Soc.* 48: 7-8 (1925). 39 references and patents.

POLANSKY, VICTOR S. Chromium plating. *Brass World* 22: 272-273 (1926). About 50 references.

RAWDON, HENRY S. Protective metallic coatings. N. Y., Chem. Cat. Co., 1928. 277 p. Bibl., p. 237-266.

REGELSBERGER, F. Altes und Neues ueber die Galvanisierung des Aluminiums. *Elektrochem. Z.* 19: 181-184; 213-220 (1913). Bibl., p. 214-220. 56 references.

SCHNEIDEWIND, RICHARD. A study of patents dealing with the electrodeposition of chromium. Univ. of Michigan, Eng. Res. Bull. no. 8. 1927. 49 p. 120 patents abstracted.

SCHNEIDEWIND, RICHARD. Study of chromium plating. Univ. of Michigan, Eng. Research Bull., No. 10. 1928. 141 p. Bibl., p. 95-121. 111 references.

SIEMENS, A. Gegenwärtiger Stand der Verchromungstechnik. *Z. Elektrochem.* 34: 264-269 (1928). 41 references.

STEINACH, HUBERT, and BUCHNER, GEORG. Die galvanischen Metallniederschläge und deren Ausführung (Galvanostegie und Galvanoplastik). Vierte Neubearb., ergänzte und verbesserte Aufl. 1923. Bibl., p. 183-184.

STOCKMEIER, H. Fortschritte der chemischen Metallbearbeitung und verwandter Zweige. *Chem.-Ztg.* 28: 182 (1904); 29: 261 (1905); 30: 343 (1906); 31: 431 (1907); 32: 743-746 (1908); 35: 749, 765 (1911); 36: 1165, 1206 (1912); 37: 1417, 1454 (1913).

TAYLOR, CYRIL S. The anode effect. *Trans. Am. Electrochem. Soc.* 47: 161-171 (1925). Bibl. footnotes.

THELLESME, J. DE. Pour le doreur, l'argenteur, le nickeleur. Paris, Dunod, 1928. 194 p. Bibl., p. 23-25.

THOMPSON, M. R. The nickel plating of zinc and zinc-base castings. *Trans. Am. Electrochem. Soc.* 47: 163-185 (1925). 33 footnotes.

WOGGINZ, ALFRED. Die galvanotechnischen Bäder; ihre chemische Untersuchung und praktische Erprobung unter Berücksichtigung der Roh- und Hilfsstoffe der Galvanotechnik. Berlin, Krayn, 1928. 121 p. Bibl., p. 120-121.

ELEMENTS

BUTLER, JOHN A. V. The chemical elements and their compounds; an introduction to the study of inorganic chemistry from modern standpoints. London, Macmillan, 1927. 205 p. Bibl. at the end of each chapter.

DRUCE, J. G. F. Elements whose existence has been announced but which are not recognized. *Science Progress* 21: 488-491 (1927). 81 references.

Elements. Index-Cat. S. G. O., 3rd ser., 5: 188-189 (1925).

HERZ, W. Fortschritte über Elemente und ihre Bausteine in den Jahren 1923-1926. *Fortschrittsber. Chem.-Ztg.* no. 3: 69-78 (1928). 311 footnotes.

SWINNE, R. Das periodischen System der chemischen Elementen in Laufe des Atombaus. *Z. tech. Physik* 7: 215-216 (1926). About 50 references.

See also names of the individual elements.

EMBALMING

Embalming. Index-Cat. S. G. O., 3rd ser., 5: 200-201 (1925).

EMBRYO *

NEEDHAM, JOSEPH. The chemistry of embryonic development. *Science Progress* 18: 84-85 (1924). 31 references.

EMERY. *See* ABRASIVES.

EMETICS

Emetics. Index-Cat. S. G. O., 3rd ser., 5: 241 (1925). 15 references.

EMETINE *

Emetine. Index-Cat. S. G. O., 3rd ser., 5: 241-242 (1925).

EMULSIN

Emulsin. Index-Cat. S. G. O., 3rd ser., 5: 252-253 (1925).

See also ENZYMES.

EMULSIONS

CLAYTON, W. Theory of emulsions and their technical treatment. 2nd ed. London, Churchill, 1928. 283 p. Bibl., p. 250-274.

EMULSIONS—Cont'd

- DOW, D. B. Oil field emulsions. U. S. Bureau of Mines, Bull. 250. 1926. Bibl., p. 105-108. Classified.
- Emulsions. Index-Cat. S. G. O., 3rd ser., 5:253 (1925).
- GHOSH, S., and DHAR, N. R. The influence of ions carrying the same charge as the dispersed particles in the inversion of emulsions. J. Phys. Chem. 30: 294-305 (1926). Bibl. footnotes.
- HOLMES, HARRY W. Émulsions et gels d'acide silicique. Bull. soc. chim. 43: 287-288 (1928). 31 references.
- KOETSCHAU, RUDOLF. Emulsionszerstörung in der Erdölindustrie. In Liesegang, Kolloidchem. Tech., 793-815 (1927). Bibl. footnotes.
- LANGE, OTTO. Technik der Emulsionen. Berlin, Springer, 1929. 391 p. Bibl. footnotes.
- SINGER, LEOPOLD. Emulgierte und versifelte Öle. Motorbetrieb und Maschinen-Schmierung (*Suppl. to Petroleum Z.*) 2, no. 1: 6-8; no. 2: 4-5; no. 3: 8-9; no. 5: 7-10 (1929). 17 references and 90 patents.
- THOMAS, ARTHUR W. Emulsions. J. Am. Leather Chem. Assoc. 22: 171-211 (1927). 83 footnotes.
- See also COLLOIDS; PHOTOGRAPHY.

ENAMELS

- COOKE, R. D. Bibliography of the literature on plasticity and setting up of enamel slips. Bull. Am. Ceram. Soc. 5: 232-234 (1926).
- DANIELSON, RAIPH R., and WOLFRAM, H. G. Vitreous enamels for metals. International critical tables II: 117 (1927). 32 references.
- FISCHER, W. Die Emailtechnik und Emailwissenschaft im Jahre 1927. Keram. Rundschau 36: 5 (1928). 70 references.
- LANDRUM, R. D., and CARTER, H. D. Bibliography and abstracts of literature on enamels. Columbus, Am. Ceram. Soc., 1929. 385 p. Alphabetical, with subject index. Includes about 400 patents.
- RICE, B. A. Bibliography of literature on enamel tests and methods of control. Bull. Am. Ceram. Soc. 5: 238-241 (1926).
- URBSCHAT, E. Enamel science and enameling technique in 1926. Keram. Rundschau 35: 7-10, 44-45 (1927).
- WILSON, SAMUEL P. Pyroxylin enamels and lacquers; their raw materials, manufacture and application. N. Y., Van Nostrand, 1927. 253 p. Bibl., p. 245-247.
- See also CERAMICS; GLASS.

ENZYMES

- BAYLISS, WILLIAM M. The nature of enzyme action. 5th ed. London, Longmans, 1925. 200 p. Bibl., p. 177-197.
- BOAS, F. Enzyme. In Wiesner, Rohstoffe des Pflanzenreiches 1: 209-210 (1927). 84 references.
- EULER, H. v. Enzyme und Co-enzyme als Ziele und Werkzeuge der chemischen Forschung. Samml. chem. chem.-tech. Vorträge 28: 250-254 (1926). 131 references.
- FABRE, RENE. Les méthodes actuelles de purification des enzymes par adsorption. Bull. soc. chim. biol. 5: 432-438 (1923). 28 references.
- Ferments. Index-Cat. S. G. O., 3rd ser., 5: 696-707 (1925). Includes amyolytic, chemistry of, digestive, examination of, inorganic, oxidizing, peptolytic, protective, proteolytic, soluble and vegetable.
- FLEURY, PAUL. Rapport entre l'activité diastatique et la réaction du milieu. Bull. soc. chim. biol. 6: 584-592 (1924). 132 references.
- FUHRMANN, FRANZ. Einführung in die Grundlagen der technischen Mykologie. 2 Aufl. Jena, Fischer, 1926. 554 p. Bibl. interspersed.
- HERZOG, MAXIMILLIAN J. A contribution to the study of the nature of enzymes. 1918. Bibl., p. 105-107.
- KÖCHLING, HANS. Ueber Versuche zur Darstellung eines künstlichen Ferments zur Glykolyse. Chemie der Zelle und Gewebe 12: 247-285 (1925). Bibl. footnotes.
- MEISENHEIMER, J. Darstellung und Anwendung der wichtigsten Enzyme. In Houben-Weyl, Meth. org. Chem., 3rd ed., II: 1042-1062 (1925). Bibl. footnotes.
- OPPENHEIMER, KARL. Die Fermente und ihre Wirkungen. 5. Aufl. Leipzig, Thieme, 1924. Bibl. footnotes.
- OPPENHEIMER, KARL. Lehrbuch der Enzyme; Chemie, physikalische Chemie und Biologie. Leipzig, Thieme, 1927. 660 p. Bibl. footnotes.
- RAMSEY, GEORGE G. Temperature coefficients of enzymic activity and the heat destruction of trypsin. Thesis, Columbia University, 1925. 29 p. Bibl., p. 28-29.
- TERROINE, EMILE F., and WURMSER, RENÉ. L'énergie de croissance. I. Le développement de *Aspergillus niger*. Bull. soc. chim. biol. 4: 564-567 (1922). 40 references.
- TSCHERMAK, v. SEYSENEGG, A. Zymothermik. In Abderhalden. Handb. biol. Arbeitsm. IV, pt. 1: 143-164 (1925). Bibl. footnotes.

WAKSMAN, SELDMAN A., and DAVISON, WILBURT C. Enzymes; properties, distribution, methods and applications. Baltimore, Williams & Wilkins, 1926. 364 p. Bibl., p. 273-350. 1323 references.

WALDSCHMIDT-LEITZ, ERNST. Die Enzyme, Wirkungen und Eigenschaften. Braunschweig, Vieweg, 1926. 233 p. Bibl. footnotes. English translation: N. Y., Wiley, 1929. 255 p.

WILLSTÄTTER, RICHARD. The adsorption of enzymes. In Alexander, Colloid chemistry II: 361-366 (1928). 31 footnotes.

WOHLGEMUTH, J. Karbohydraten. In Abderhalden, Handb. biol. Arbeitsm. IV, pt. 1: 463-494 (1925). Bibl. footnotes.

See also names of various enzymes.

EOSIN*

Eosin. Index-Cat. S. G. O., 3rd ser., 5: 297 (1925).

EPHEDRINE

CHEN, K. K., and KAO, C. H. Ephedrine and pseudoephedrine, their isolation, constitution, isomerism, properties, derivatives and synthesis. J. Am. Pharm. Assoc. 15: 636-639 (1926). About 100 references.

EPINEPHRIN. See ADRENALIN.

EREPSIN

Erepsin. Index-Cat. S. G. O., 3rd ser., 5: 357 (1925). 25 references.

See also ENZYMES.

ERGOT

CRAWFORD, ALFRED C. Review of the chemical work done on the active principle of ergot. Am. J. Pharm. 83: 147-171 (1911). 72 references.

Ergot. Index-Cat. S. G. O., 3rd ser., 5: 359-361 (1925).

SCHÄLLBAUM, HULDRICH. Praktische Versuche mit dem spezifischen Mutterkornalkaloid Ergotamin beim Rinde. Inaug.-Diss., Zurich, 1923. 43 p. Bibl., p. 41-43.

ESSENTIAL OILS

BOURNOT, K. Aetherische Oele und Kampfer. In Wiesner, Rohstoffe des Pflanzenreiches 1: 107-109 (1927). 112 references.

FINNEMORE, HORACE. The essential oils. N. Y., Van Nostrand, 1928. 879 p. Bibl. footnotes.

GILDEMEISTER, EDUARD, and HOFFMANN, FR. Die ätherischen Oele. Miltitz bei Leipzig, Schimmel & Co., Aktiengesellschaft, 1928. Vol. 1. 864 p. Bibl. footnotes.

Huiles essentielles. In Tables annuelles V: 1521 (1917-1922); 138 references. VI: 1341-1342 (1923-1926). 117 references.

RENNIE, E. H. Chemical exploitation, past, present and future, of Australian plants. Australasian Assoc. Adv. Sci. 18: 31-35 (1926). 103 references.

SOCIETY OF CHEMICAL INDUSTRY. Fine chemicals, medicinal substances and essential oils. In Reports of the progress of applied chemistry 10: 543-570 (1925); 148 footnotes 11: 589-614 (1926); 129 footnotes 12: 626-657 (1927); 162 footnotes 13: 612-639 (1928); 110 footnotes.

SODEN, H. v. Fortschritte auf dem Gebiet der ätherischen Oele und Riechstoffe. Fortschrittsber. Chem.-Ztg. no. 1: 13-32 (1927). 416 footnotes.

ESTERS*

BACHÉ, FRANZ. Die Veresterung der Carboxylgruppe. In Abderhalden, Handb. Biol. Arbeitsm. 1, pt. 1: 775-910 (1925). Bibl. footnotes.

Esters. Index-Cat. S. G. O., 3rd ser., 5: 388-389 (1925).

HESS, KURT. Verestern und Verseifen. In Houben-Weyl, Meth. org. Chem., 3rd ed., II: 640-715 (1925). Bibl. footnotes.

See also CHEMICAL EQUILIBRIUM; CHEMICAL KINETICS.

ETCHING: Metallographic.

CAMPELL, WILLIAM. Bibliography of etching. Proc. Am. Soc. Testing Materials 24, I: 738-739 (1924). 10 references, annotated.

ETHERS*

MEERWEIN, HANS. Die Alkoxy- und Oxydo- (Alkylendioxyd) Gruppe. In Houben-Weil, Meth. org. Chem., 2nd ed., III: 103-175 (1923). Bibl. footnotes.

ETHYL ALCOHOL

COOLEY, LOYD C. Anhydrous alcohol in America. Chem. Met. Eng. 34: 728 (1927). 41 references.

KLOCKER, A. Die Gärungsorganismen in der Theorie und Praxis der Alkoholgärungs Gewerbe. Berlin, Urban and Schwarzenberg, 3rd ed. 447 p. Bibl., p. 383-431.

PIQUE, R. Histoire de l'alcool et de la distillerie. Chimie et industrie, Special No., April, 1928: 785. 60 footnotes.

SCHWARTZ, FRITZ. (Alcohol, determination in forensic practice with special regard to technic.) Deut. Z. ges. gericht. Med. 10: 377-407 (1927).

See also FERMENTATION.

ETHYL ALCOHOL: Physiological effects.

KOSTITCH, ALEXANDRE. Action de l'alcoolisme expérimental sur le testicule (étude histologique et chimique). Thèse, Univ. de Strasbourg, 1921. 111 p. Bibl., p. 107-111.

PEARL, RAYMOND. Alcohol and longevity. N. Y., Knopf, 1926. 273 p. Bibl., p. 242-260.

WEEKS, COURTENAY C. Alcohol in medical practice, with a chapter on the evolution of medical opinion. London, Lewis, 1925. 186 p. Bibl., p. 185-186.

ETHYL BROMIDE

Ethyl bromide. Index-Cat. S. G. O., 3rd ser., 5: 403-404 (1925).

ETHYL CHLORIDE

Ethyl chloride. Index-Cat. S. G. O., 3rd ser., 5: 404-406 (1925).

ETHYL ETHER

Ether. Index-Cat. S. G. O., 3rd ser., 5: 390-396 (1925). Includes use as anesthetic.

ETHYLENE

Ethylene. Index-Cat. S. G. O., 3rd ser., 5: 406-407 (1925).

ETHYLENE GLYCOL

TAYLOR, C. A., and RINKENBACH, W. H. Ethylene glycol. Ind. Eng. Chem. 18: 676-678 (1926). 27 footnotes.

See also GLYCOLS.

EUCAINE

Eucaine. Index-Cat. S. G. O., 3rd ser., 5: 408 (1925). 16 references.

EUGLOBIN*

HAFNER, E. A. Der Kolloidzustand des Euglobins als Funktion des Dispersionsmittels. Klin. Wochschr. 4: 804 (1925). 23 references.

EVAPORATION

BADGER, W. L. Heat transfer and evaporation. N. Y., Chem. Cat. Co., 1926. 306 p. Bibl. footnotes; patent index, p. 293-295.

HEINZELMANN, R. (Evaporating apparatus; a clear presentation of all the inventions in this field.) Der Apparatebau 35: 209-212, 219-225, 229-235, 239-244, 249-255 (1923); 36: 1-7, 11-17, 21-27, 33-34, 43-47, 53-55, 63-65, 75-78, 87-89, 99-100, 111-115, 123-124, 138-139, 153-154, 166-167, 180, 190, 203, 215-216, 225-227, 238-241, 247-251 (1924). Review of German patents.

KUENEN, J. P. Theorie der Verdampfung und Verflüssigung von Gemischen. Leipzig, Barth, 1906. 244 p. Bibl. footnotes.

MCCABE, W. L. Literature on evaporation. Chem. Met. Eng. 32: 579 (1925). 16 references.

MERKEL, FRIEDRICH. Verdunstungskühlung. Berlin, V. D. I.-Verlag, 1925. 48 p. Bibl., p. 48.

RECHENBERG, C. v. Einfache und fraktionierte Destillation. Miltitz, Schimmel, 1923. 814 p. Bibl., p. 40-41, 395-396.

EXPLOSIONS: Gaseous.

BONE, WM. A. and TOWNEND, DONALD T. A. Explosions and gaseous explosives. International critical tables II: 174, 175, 181-182, 184, 187, 195 (1927). 423 references.

BONE, WM. A., and TOWNEND, DONALD T. A. Flame and combustion in gases. London, Longmans, 1927. 548 p. Each section has a bibl.

BROWN, GEORGE G., and WATKINS, GEORGE B. Gaseous explosions. Probable mechanism causing engine trouble. Ind. Eng. Chem. 19: 369 (1927). 33 references.

CLARK, G. L., and THEE, W. C. Present status of the facts and theories of detonation. Ind. Eng. Chem. 17: 1219-1226 (1925). 61 references.

COWARD, H. F., and JONES, G. W. Limits of inflammability of gases and vapors. Bureau of Mines, Bull. 279. 1928. 99 p. Bibl., p. 88-93. 107 references.

FARADAY SOCIETY, LONDON. Explosive reactions in gaseous media; a general discussion held by the Faraday society, June, 1926. Trans. Faraday Soc. 22: 251-375 (1926). Contains bibls.

LAFFITTE, P. L'onde explosive dans les mélanges gazeux. Bull. soc. chem. 41: 743-745 (1927). 38 references.

ROSENCRANS, CRANDALL Z. Bibliography on gaseous explosions. Univ. Ill., Eng. Expt. Sta., Bull. 156: 50-62 (1926). Ref. nos. 218-374. Cf. Bull. 133.

WENDLANDT, RUDOLF. Die Detonationsgrenze in explosiven Gasgemischen. Z. physik. Chem. 116: 227-260 (1925). Bibl. footnotes.

EXPLOSIVES

BRUNSWIG, H. Explosivstoffe. Leipzig, Barth, 1909. 177 p. Bibl. footnotes.

DUPONT DE NEMOURS, E. I., and Co. Blasters' handbook, describing practical methods of using explosives for various purposes, prepared under the direction of Arthur LaMotte, manager of the Technical Section. 5th ed. Wilmington, Del., DuPont Co., 1928. 215 p. Bibl., p. 200-204.

ESCALES, R. Die Explosivstoffe. Leipzig, Veit, 1905-1917. 7 vols. Bibl., 1: 462-466; 2: 295-296; 3: 321-322; 4:

- 226-228; 5:200-201; 6:439; 7:521-522. Patents, 1:467; 2:297-298; 3:323; 4:229-230; 5:202-203; 6:448; 7:523-524.
- JONES, ELWYN. Method for the determination of the velocity of detonation over short lengths of explosives. *Gt. Brit., Safety in Mines Research Board, Paper no. 22. 1926. 21 p. Bibl. footnotes.*
- KAUSCH, O. Die Herstellung, Verwendung und Aufbewahrung von flüssiger Luft. Weimar, Steinert, 1919. *Bibl., p. 461-463.*
- KOETTNITZ, J. P. Ueber den Zerfall von Sprengstoffen. *Z. Elektrochem. 34: 768-783 (1928). Bibl., p. 783. 34 references.*
- LISSE, L. Das Sprengluftverfahren. Berlin, Springer, 1924. 109 p. *Bibl., p. 104-107.*
- NAOUM, PH. Schiess- und Sprengstoffe. Dresden, Steinkopff, 1927. 199 p. Contains ample references to the original publications.
- OELKER, A. Initialzündungen. *Z. ges. Schiess-Sprengstoffw. 10: 140-141, 169-170, 217-218, 342-346 (1915). Patent review.*
- RAUCH, PETER. Kritische Erörterung über den Einfluss des Hohlraumes im Bohrloch auf die wirtschaftliche Arbeitsleistung fester und Flüssigluftsprengstoffe bei besonderer Berücksichtigung der für den Kalibergbau gegebenen Verhältnissen. 2. Aufl. Darmstadt, 1927. 37 p. *Bibl., p. 36-37.*
- RHEINBOLDT, H. Bestimmungen der Entflammungs- und Entzündungstemperatur. *In Houben-Weyl, Meth. org. Chem., 3rd ed., 1: 1173-1195 (1925). Bibl. footnotes.*
- SEDLACZEK, —. Neuerungen auf dem Gebiete der Schiess-, Spreng- und Zündmittel während und nach dem Kriege. *Z. ges. Schiess-Sprengstoffw. 19: 49-53, 83-87, 104-106, 115-119, 136-139, 152-154, 170-172 (1924); 20: 22-25 (1925). 230 patents through text.*
- SOCIETY OF CHEMICAL INDUSTRY. Explosives. *In Annual Reports on the progress of applied chemistry 10: 652-685 (1926); 182 footnotes. 13: 666-693 (1928); 139 footnotes.*
- STETTbacher, ALFRED. Das Sprengstoffwesen in den Jahren 1914-1923. *Chem.-Ztg. 49: 621-622, 642, 646-647, 666-667, 682-684, 713-716, 729-732, 737-740 (1925). 333 footnotes.*
- STETTbacher, A. Das Sprengstoffwesen in den Jahren 1924-1927. *Fortschrittb. Chem.-Ztg. No. 1: 1-32 (1929). 347 footnotes.*
- UNITED STATES. War Department. Ordnance Office. Military explosives. 2nd ed. By C. G. Storm. War Dept. Doc. 947. 1924. *Bibl., p. 150-158.*
- VAN GELDER, ARTHUR P., and SCHLATTER, HUGO. History of the explosives industry in America. Columbia Univ. Press, 1927. Contains bibl. footnotes. *See also AIR: LIQUID; DYES (Doyle).*
- EXTRACTS: Animal.***
Extracts, animal. *Index-Cat. S. G. O., 3rd ser., 5: 443-447 (1925). Includes therapeutic uses.*
- EXUDATES ***
Exudates and transudates. *Index-Cat. S. G. O., 3rd ser., 5: 463-464 (1925).*
- EYE ***
Lens (chemistry of.) *Index-Cat. S. G. O., 3rd ser., 7: 565 (1928). 17 references.*
- FARNESOL ***
GROSJEAN, J., and MARTINET, J. Le farnesol. *Chimie et industrie 14: 367 (1925). 20 references.*
- FASTING**
Fasting. *Index-Cat. S. G. O., 3rd ser., 5: 650-651 (1925).*
See also NUTRITION.
- FATIGUE**
DHERS, VICTOR. Les tests de fatigue; essai de critique théorique. 1924. *Bibl., p. 167-185.*
Fatigue, effects of chemical and physical agents on. *Index-Cat. S. G. O., 3rd ser., 5: 661 (1925).*
- FATS (Including oils and waxes)**
ANDES, LOUIS E. Vegetable fats and oils; their practical preparation, purification, properties, adulteration and examination. 4th ed. London, Scott. 1925. *Bibl. footnotes.*
- BOLTON, E. RICHARDS, and PELLY, RUSSELL G. Oils, fats, waxes and resins. With a special section on mineral lubricating oils by Harold Moore. London, Benn, 1924. 275 p. *Bibl., p. 262-265.*
- BURTON, D., and SHAW, R. G. F. A bibliography on oils, fats and waxes. *J. Int. Soc. Leather Trades Chem. 12: 490-505 (1928); J. Am. Leather Chem. Assoc. 24: 196-212 (1929). 291 references, classified. Special references to sulfonated oils.*
- Corps gras et cires. *In Tables annuelles V: 1536 (1917-1922); 94 references. VI: 1353 (1923-1926); 52 references.*
- DAVIES, W. L. The deterioration of fats and the development of rancidity. *Ind. Chemist 4: 269-272 (1928). Bibl., p. 272. 16 references.*
- DERX, H. G. De oxydatieve afbraak van vetten door schimmels. *Verslag Akad. Wet. Amsterdam 33: 545-558 (1925). Bibl. footnotes.*

FATS (Including oils and waxes)—*Cont'd*

ELSDON, G. D. The chemistry and examination of edible oils and fats, their substitutes and adulterants. London, Benn, 1926. 521 p. Contains bibls.

FABRIS, GUIDO. Olii e grassi; vegetali, animali e minerali. Ed. 2, rev. & enl. 1923. Bibl., p. 665-671.

Fat (and fats). Index-Cat. S. G. O., 3rd ser., 5: 652-660 (1925). Includes analysis, chemistry of, dietetics of, digestion, absorption and excretion of, estimation of and tests for, physiology of, synthesis of, and vegetable.

FRITSCH, J. Fabrication et raffinage des huiles et graisses d'origine animale; huiles et graisses d'animaux marins. 2nd ed. 1927. Bibl. footnotes.

GNAMM, HELLMUT. Die Fettstoffe in der Lederindustrie. Stuttgart, Wissenschaftliche Verlagsgesell. m. b. H., 1926. 597 p. Bibl. footnotes.

HILDITCH, THOMAS P. The industrial chemistry of the fats and waxes. London, Bailliere, Tindall and Cox, 1927. 461 p. References at end of sections.

LEATHES, JOHN BERESFORD, and RAPER, H. S. The fats. 2nd ed. London, Longmans, 1925. 242 p. Bibl., p. 219-238.

MIKOSCH, K. Pflanzenfette. In Wiesner, Die Rohstoffe des Pflanzenreiches, 1: 623-699 (1914). Bibl. footnotes.

MITCHELL, C. AINSWORTH. Animal and vegetable oils, fats and waxes. International critical tables 11: 216-217 (1927). 225 references.

MORRELL, R. S., and WOOD, H. R. Chemistry of drying oils. London, Benn, 1925. 224 p. Bibl. at end of chapters.

SCHIEBER, J. Ueber die Gallertbildung fatter Oele. Kolloid-Z. 46: 337-345 (1928). 59 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Oils, fats and waxes. In Reports of the progress of applied chemistry 10: 310-333 (1925); 101 footnotes. 11: 312-340 (1926); 125 footnotes. 12: 322-345 (1927); 89 footnotes. 13: 352-380 (1928); 150 footnotes.

STEINER, O. Industrie der Fette und Seifen. Dresden, Steinkopff, 1925. 83 p. Bibl. footnotes.

WOLFF, H., and MÜLLER, A. Fette und Öle. In Wiesner, Rohstoffe des Pflanzenreiches 1: 800-809 (1927). 722 references.

See also ELECTRICAL INSULATION (Fyfe); FLAX-SEED.

FATS: Analytical.

CHARLIERS, N. Les méthodes de dosage des acides volatils dans les matières grasses. Chimie et industrie, Special No., April, 1928: 523-530. 43 references.

GRUEN, ADOLF. Analyse der Fette und Wachse. Berlin, Springer, 1925. v. 1, 575 p. Bibl. footnotes.

KAUFMANN, H. P. Quantitative Bestimmung der ungesättigten Fettsäuren der Kakao-Butter. Z. angew. Chem. 42: 402-406 (1929). 25 footnotes.

KAUFMANN, H. P., and KELLER, M. Die rhdanometrische Bestimmung linolensäurehaltiger Fette; Analyse des Leinöls. Z. angew. Chem. 42: 20-23, 73-77 (1929). 41 footnotes.

See also OILS: ANALYSIS.

FATS: Physiological.

BLOOR, W. R. Biochemistry of the fats. Chem. Reviews 2: 295-300 (1925). 205 references.

BLOOR, W. R. The utilization of fat in the animal body. J. Metabolic Research 4: 572-574 (1923). 54 references.

HAHN, H., and KINTOFF, W. Beitrag über den chemischen Mechanismus der Fettbildung aus Zucker. Chemie der Zelle und Gewebe 12: 115-156 (1925). Bibl. footnotes.

FECES

Feces, chemistry of. Index-Cat. S. G. O., 3rd ser., 5: 620-621 (1925).

Feces, examination of, methods in. Index-Cat. S. G. O., 3rd ser., 5: 622-623 (1925).

Feces, fat and fatty acids in. Index-Cat. S. G. O., 3rd ser., 5: 623-624 (1925).

SCHREUER, MAX. Kotbildung, Zusammensetzung und Chemie der Fäces. In Oppenheimer, Handb. Biochem. 5: 345-384 (1924). 179 footnotes.

FEEDING AND FEEDING STUFFS *

BECHDEL, SAMUEL I., and HONEYWELL, H. E. The relation between the vitamin B content of the feed eaten and of the milk produced. J. Agr. Research 35: 287-288 (1927).

BETHKE, ROLAND M., et al. The comparative nutritive value of the proteins of linseed meal and cottonseed meal for different animals. J. Agr. Research 36: 870-871 (1928).

BOHSTEDT, GUSTAV. Mineral and vitamin requirements of pigs, with special reference to the effect of diet on bone development. Ohio Agr. Expt. Sta., Bull. 395. 1926. 170 p. Bibl., p. 227-229.

- GAINES, WALTER L., and NEVENS, W. B. The sunflower as a silage crop, composition and yield at different stages of maturity. Univ. of Illinois, Agr. Expt. Sta., Bull. no. 268. 1925. 49 p. Bibl., p. 454-455.
- HAMILTON, TOM S., *et al.* The digestibility and metabolizable energy of soybean products for sheep. Univ. of Illinois, Agr. Expt. Sta., Bull. no. 303. 1928. 57 p. Bibl., p. 281-282.
- LINDSEY, JOSEPH B., *et al.* The digestibility and energy values of feeds for horses. J. Agr. Research 32: 603-604 (1926).
- NAUE, KURT. Der deutsche Grünfuttermittel. Geschichtliche Entwicklung, Einsäuerungsverfahren, betriebswirtschaftliche Bedeutung, Baukonstruktion. Berlin, Parey, 1926. 176 p. Bibl., p. 161-166.
- REED, O. E., HUFFMAN, C. F., and ADDINGTON, L. H. Cottonseed meal as a feed for dairy calves. J. Dairy Sci. 11: 506-507 (1928). 45 references.
- SCHARRER, K., and STROBEL, A. Der gegenwärtige Stand der Futterkonservierung. Z. angew. Chem. 38: 1034-1040 (1925). 61 references.
- SOTOLA, JERRY. Relation of maturity to the nutritive value of first, second and third cuttings of irrigated alfalfa. J. Agr. Research 35: 381-383 (1927).
- FELDSPAR**
- ANDERSON, OLAF. Feltspat. I. Feltspatmineralenes egenskaper, forekomst og praktiske utnyttelse med særlig henblikk på den Norske feltspatindustri. Oslo, I kommission hos A. Aschehoug & Co., 1926. 142 p. Bibl., p. 133-134.
- LADOO, R. B. Feldspar. In *his* Non-Metallic minerals, 221-222 (1925). 22 references.
- MELLOR, J. W. The feldspars. In *his* Inorg. theor. chem. 6: 683-691 (1925). About 900 references.
- FERMENTATION**
- ALLEN, PAUL W. Industrial fermentations. N. Y., Chem. Cat. Co., 1926. 424 p. References at end of most of the chapters.
- BURKEY, LLOYD A. Fermentation of cornstalks and their constituents. Iowa State College J. Sci. 3: 97-100 (1928).
- Fermentation. Index-Cat. S. G. O., 3rd ser., 5: 691-696 (1925). Includes alcoholic, bacterial, lactic.
- FERNBACH, A. Les progrès récents de nos connaissances sur la fermentation alcoolique. Bull. soc. chim. biol. 6: 893-896 (1924). 53 references.
- FUCHS, WALTER. Der gegenwärtige Stand des Gärungsproblems. Sammlung chem. chem.-tech. Vorträge 27: 1-48 (1924). Bibl. footnotes.
- HENNEBERG, WILHELM. Handbuch der Gärungsbakteriologie. 2., neubearb. und verm. Aufl. Berlin, Parey, 1926. 2 v. Bibl., Vol. 2: 389-393.
- JÖRGENSEN, ALFRED P. C. Micro-organisms and fermentation. 5th ed. London, Griffin, 1925. 467 p. Bibl., p. 403-461.
- JOHNSON, A. H., and BAILEY, C. H. Physicochemical study of cracker dough fermentation. Cereal Chem. 1: 327-410 (1924). Bibl., p. 405-409.
- KLÖCKER, ALBERT. Die Gärungsorganismen in der Theorie und Praxis der Alkohol-gärungsgewerbe. Mit besonderer Berücksichtigung der Einrichtungen und Arbeiten gärungsphysiologischer und gärungstechnischer Laboratorien. 3., neubearb. Aufl. Berlin, Urban & Schwarzenberg, 1924. 447 p. Bibl., p. 383-431.
- MAMELI, EFISIO. Azione di alcune sostanze organiche sulla fermentazione alcoolica. Giorn. chim. ind. appl. 8: 555-564 (1926). 73 footnotes.
- NEUVILLE, HENRI. Les ferments industriels d'Extrême-Orient (biologie, emploi et produits). Paris, Masson, 1902. 192 p. Bibl., p. 185-190.
- NORD, F. F. Chemical processes in fermentations. Chem. Reviews 3: 76-79 (1926).
- PEDERSON, C. S., and BREED, R. S. Fermentation of glucose by organisms of the genus *Serratia*. J. Bact. 16: 183-185 (1928).
- POLLAIS, PANOS. Les ferments lactiques et leurs applications en médecine vétérinaire. Thèse, Univ. de Paris, 1926. 150 p. Bibl., p. 140-150.
- SCHOEN, M. The problem of fermentation. London, Chapman and Hall, 1928. Bibl. at end.
- SCHOEN, M. Le problème des fermentations; les faits et les hypothèses. Paris, Masson, 1926. 199 p. Bibl., p. 169-194.
- SOCIETY OF CHEMICAL INDUSTRY. Fermentation industries. In Annual reports on the progress of applied chemistry 10: 481-523 (1925); 176 footnotes. 11: 503-541 (1926); 99 footnotes. 12: 512-558 (1927); 170 footnotes. 13: 531-564 (1928); 158 footnotes.
- TANNER, F. W., and EAGLE, I. O. Research in pickle fermentation. Canning Age 7: 783-785 (1926). A chronological review with 37 references. See also ENZYMES; ETHYL ALCOHOL; YEAST.

FERRIC OXIDE*

FURNAS, CLIFFORD COOK. The thermal properties of ferric oxide. Thesis, University of Michigan, 1926. 52 p. Bibl., p. 13, 51-52.

FERROMANGANESE. See STEEL.**FERROSILICON. See SILICIDES; STEEL.****FERTILIZERS**

ARRHENIUS, O. Der Kalkbedarf des Bodens vom pflanzenphysiologischen Standpunkt. I. Z. Pflanzenernähr. Düngung 3: 148-151 (1924). 76 references.

ARRHENIUS, O. Der Kalkbedarf des Bodens vom pflanzenphysiologischen Standpunkt. II. Die Bodenreaktion und das Wachstum der höheren pflanzen. Z. Pflanzenernähr. Düngung 4: 47-52 (1925). 140 references.

ARRHENIUS, O. Der Kalkbedarf des Bodens vom pflanzenphysiologischen Standpunkt. III. Der Einfluss der Bodenreaktion auf die biologischen und physikalisch-chemischen Bodenfaktoren. Z. Pflanzenernähr. Düngung 4: 356-358 (1925). 57 references.

BARTHOLOMEW, R. P. The availability of potassium to plants as affected by barnyard manure. Am. J. Agron. 20: 80-81 (1928). 19 references.

BOBKO, E. W. Zur Frage über die schädliche Wirkung hoher Kalkgaben. Z. Pflanzenernähr. Düngung 6: 167-168 (1926). 39 references.

BOBKO, E. W., and DRUSCHININ, D. W. Einfluss einzelner Faktoren auf die Reaktion der Bodenlösung. Z. Pflanzenernähr. Düngung 5: 368-369 (1925). 36 references.

BOLLEN, W. B. Biochemical effects of gypsum on Iowa soils. Soil Science 19: 439 (1925). 24 references.

COOPER, J. R. Study of the effect of commercial fertilizers on the performance of apple trees. Ark. Agr. Expt. Sta., Bull. 227: 54-61 (1928).

CUBBON, MILES H. Calcium sulfate as a soil amendment. Reprinted from Cornell University, Agr. Expt. Sta. Memoir 97, May, 1926. 51 p. Bibl., p. 47-51.

EDDELBÜTTEL, H. Chilesalpeter oder synthetischer Natronsalpeter. Z. angew. Chem. 41: 309-314 (1928). 38 references, p. 314.

FUDGE, J. F. Influence of various nitrogenous fertilizers on the availability of phosphates and potassium. Ala. Agr. Expt. Sta., Bull. 227: 47-49 (1928).

HEINRICH, FRANZ P. Die Beeinflussung der Hygroskopizität und der Wasserstoffionenkonzentration des Bodens

durch künstliche Düngung. Inaug. Diss., Königsberg, 1926. 51 p. Bibl., p. v-vi.

HINKLE, SAMUEL F. Fertility and crop production; a handbook for the student and farmer. Sandusky, O., The author, 1925. 338 p. Bibl., p. 310-331.

HUNT, CHARLES H. A study of the influence of fertilizers on the vitamin-B content of wheat. Thesis, Ohio State Univ., 1926. 41 p. Bibl., p. 40-41.

INTERNATIONAL INSTITUTE OF AGRICULTURE. Le contrôle des engrais dans le monde. Rome, 1928. 123 p. Bibl. interspersed.

KNICKMANN, ERICH. Untersuchungen zur Frage der Bodenazidität. Z. Pflanzenernähr. Düngung 5: 1-92 (1925). 190 footnotes.

KNICKMANN, E., and HELBIG, M. Untersuchungen über Bodenverlagerung. Z. Pflanzenernähr. Düngung 5: 209-248 (1925). 96 footnotes.

KRÜGER, KURT. Die Wirkung stickstoffhaltiger Düngemittel auf den Wert des Pflanzgutes und die Zusammensetzung der Kartoffel bei vier verschiedenen Bodenarten. Landw. Jahrb. 66: 841-843 (1927).

KRUPPA, HELMUT. Eine Studie über das Bodenuntersuchungsverfahren nach Prof. Neubauer, Dresden. Z. Pflanzenernähr. Düngung 7: 126-127 (1926). 42 references.

LANGE, WILHELM. Beiträge zur Bestimmung des Düngedürfnisses eines Bodens vermittels Pflanzen- und Bodenanalyse. Z. Pflanzenernähr. Düngung 6: 193-228 (1926). 60 footnotes.

LÖHNIS, F. Nitrogen availability of green manures. Soil Science 22: 288-290 (1926). 49 references.

MCKIBBIN, R. R. The effect of sulphur on soils and on crop yields. Md. Agr. Expt. Sta., Bull. no. 296: 109-113 (1928).

MAGISTAD, O. C. The aluminium content of the soil solution and its relation to soil reaction and plant growth. Soil Science 20: 211-213 (1925). 62 references.

MONACO, ERNESTO. Sull' impiego di alcune rocce silicate nella concimazione potassica. Staz. sper. agr. Ital. 55: 434-446 (1922). 39 references.

NATIONAL FERTILIZER ASSOCIATION. World conditions as to mineral raw materials for the fertilizer industry. Addresses delivered at the meeting of the Institute of Politics at Williamstown, Mass., Aug. 12-14, 1926. Washington, D. C., publ. by the National

- Fertilizer Assoc., 1926. 180 p. Bibl., p. 173-180.
- PIETERS, ADRIAN J. Green manuring, principles and practice. N. Y., Wiley, 1927. 356 p. Bibl., p. 325-340.
- PRANISCHNIKOW, D. N. Ammoniak, Nitrate und Nitrite als Stickstoffquellen für höhere Pflanzen. *Ergeb. Biol.* 1:445-446 (1926). 68 references.
- ROSS, WM. H. Bibliography on concentrated fertilizers and fertilizer materials. Prepared by U. S. Dept. of Agr., Bureau of Chemistry and Soils. Mimeographed and distributed by American Fertilizer Assoc. 1928. 39 p. 500 references.
- RUSCHMANN, G. Vergleichende biologische und chemische Untersuchungen an Stalldüngersorten. *Centr. Bakt. Parasitenk.* II Abt., 75:423-426 (1928). 68 references.
- SMITH, ARTHUR M. Study of the factors influencing the efficiency of different forms of nitrogen as related to soil type and cropping systems in the Atlantic coastal plain region. *Soil Science* 23:160-164 (1927). 83 references.
- SMITH, FREDERICK B. Some effects of method of application of fertilizers on corn and soils. *Iowa Agr. Expt. Sta., Res. Bull.* 104:102-104 (1927).
- SMITH, JOHN E. The fertilizer materials of Iowa. In *Iowa Geological Survey, Reports and Papers* 31:148-151 (1926).
- SNYDER, ROBERT M. The physical action of lime on clay soils. Thesis, Cornell Univ., 1918. 35 p. Bibl., p. 25-35.
- SPUIJ, M. J., VAN DER. Vergleichende Untersuchungen über die Feststellung der Düngedürftigkeit der Böden an Phosphorsäure. *Z. Pflanzenernähr. Düngung* 5:281-325 (1925). 68 footnotes.
- STOLTE, HERMANN K. O. C. Untersuchungen von Hafersorten unter besonderer Berücksichtigung ihrer Reaktion auf Stickstoffdüngung. *Inaug.-Diss., Landw. Hochschule, Berlin*, 1925. 56 p. Bibl., p. 53-55.
- STRÖBEL, A. Der Einfluss einer zwölfjährigen Kalkdüngung auf die Ernteerträge sowie die Physik, Chemie und Mykologie des Bodens. *Landw. Vers. Stat.* 105:127-131 (1926).
- VOICU, JULIU. Influence du bore sur quelques microbes du sol. Paris, Éditions de la vie universitaire, 1923. 148 p. Bibl., p. 137-146.
- WICHERN, G. Berichte über die Fortschritte in der Düngemittel-Industrie in den Jahren 1921-1924. *Chem.-Ztg.* 49:885-886, 892-895 (1925). 67 footnotes.
- See also AGRICULTURAL CHEMISTRY; CACAO; GYPSUM; PHOSPHATES; SOILS.
- ### FIBERS
- AUERBACH, RUDOLF. Textilindustrie. In *Liesegang, Kolloidchem. Tech.*, 487-515 (1927). Bibl. footnotes.
- BARKER, J., and PRIESTLY, L. P. Conditioning. *J. Textile Inst.* 16:P283-P296 (1925). 53 references.
- BARR, GUY. The action of light on textiles. *Trans. Faraday Soc.* 20:293-294 (1925). 32 references.
- DENNY, GRACE G. Fabrics and how to know them; definitions of fabrics, practical textile tests, classification of fabrics. 3rd ed. Philadelphia, Lippincott, 1928. 152 p. Bibl., p. 149-152.
- GIBBS, CHARLOTTE M. Household textiles. 2nd ed. Boston, Whitcomb & Barrows, 1923. 256 p. Bibl., p. 241-246.
- HEERMANN, PAUL. Färberei und textilechemische Untersuchungen. 4th ed. Berlin, Springer, 1923. 370 p. Bibl. footnotes.
- HEERMANN, PAUL. Mechanisch- und physikalisch-technische Textiluntersuchungen. 2. Aufl. Berlin, Springer, 1923. 270 p. Bibl. footnotes.
- HEERMANN, PAUL. Tecnología química de los textiles; estudio de los procedimientos de blanqueo, teñido, mercerización, estampado, apresto y acabado de los tejidos y las fibras textiles. Barcelona, Gili, 1925. 704 p. Bibl. footnotes.
- HUEBNER, J. Surveys of recent progress in the dyeing, printing and allied industries. I. Textile fibers. *Artificial silk. J. Soc. Dyers Colourists* 41:387-401 (1925). 350 papers with brief abstracts.
- JOHNSON, GEORGE H. Textile fabrics; their selection and care from the standpoint of use, wear, and launderability. N. Y., Harper, 1927. 385 p. Bibl., p. 376-377.
- JOVANOVITS, —. Ueber Textilschaden und deren Ursachen. *Textilber.* 6:836-837 (1925). 85 references.
- LOWENTHAL, RICHARD. Fortschritte in der chemischen Technologie der Spinnfasern in den Jahren 1919-1927. *Fortschrittsber. Chem.-Ztg.*, no. 4:105-118 (1928). 294 footnotes.
- MARCUS, BENNO. Grosses Textilhandbuch, ein Lehr- und Nachschlagewerk für das gesamte Textil- und Bekleidungs-fach. Nordhausen a. H., Külinger, 1928. 1144 p. Bibl., p. 1120-1124.

FIBERS—Cont'd

MEYER, H. H. B. List of references on the carpet and rug industry. U. S. Library Congress, Aug. 16, 1922. 6 p.

MÖLLER, FEDOR. Die Wärmewirtschaft in der Textilindustrie. Dresden, Steinkopff, 1926. 112 p. Bibl., p. 103-108.

RENOUARD, ALFRED. Les industries du lin, du chanvre, du jute et de leurs succédanés. Paris, Librairie polytechnique, Béranger, 1921. 565 p. Bibl., p. 332-342.

SCHULTZ, J. Farbstofftabellen. 6th ed. Berlin, Wiedemann, 1923. Bibl., vol. 2: 270-272.

SCHWARZ, —. Die Herstellung wasserdichter Gewebe. Kunststoffe 15: 49-53, 74-77, 137-141 (1925). Patents through text.

SOCIETY OF CHEMICAL INDUSTRY. Bleaching, dyeing, printing and finishing. In Reports of the progress of applied chemistry 10: 165-187 (1925); 203 footnotes. 11: 144-166 (1926); 219 footnotes. 12: 144-169 (1927); 242 footnotes. 13: 136-156 (1928); 92 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Fibres, textiles, cellulose and paper. In Reports of the progress of applied chemistry 10: 137-164 (1925); 183 footnotes. 11: 117-143 (1926); 185 footnotes. 12: 120-143 (1927); 161 footnotes. 13: 136-156 (1928); 92 footnotes.

TROTMAN, S. R., and TROTMAN, E. R. The bleaching, dyeing and chemical technology of textile fibers. Lippincott, 1926. 610 p. Bibl., p. 593.

URQUHART, A. R., and WILLIAMS, A. M. A review of work on the absorption and desorption of moisture by textile materials. Trans. Faraday Soc. 20: 313 (1925). 20 references.

WEESE, J., and ZEISEL S. Fasern und Baste. In Wiesner, Rohstoffe des Pflanzenreiches 1: 682-704 (1927). 800 references.

WIESNER, J., and ZEISEL, S. Fasern. In Wiesner, Rohstoffe des Pflanzenreiches, III: 1-405 (1921). Bibl. footnotes.

Wirkerei und Strickerei, Netzen und Filetstrickerei, von Fachschulrat Carl Aberle. Maschinenflechten u. Maschinenklöppeln, von Walter Krumme. Flecht- und Klöppelmaschinen, von H. Glafey. Samt, plüsch, künstliche Pelze, von H. Glafey. Die Herstellung der Teppiche, von H. Sautter. Stickmaschinen, von R. Glafey. Berlin, Springer, 1927. 615 p. Bibl. at end of some of the chapters.

WOOLMAN, MARY, and MCGOWAN, ELLEN B. Textiles; a handbook for the student and the consumer. Rev. ed. N. Y., Macmillan, 1926. 572 p. Bibl., p. 535-542.

See also CELLULOSE; COTTON; FLAX; HEMP; PAPER; SILK; WOOL.

FIBRIN

Fibrin. Index-Cat. S. G. O., 3rd ser., 5: 724-725 (1925).

Fibrinogen. Index-Cat. S. G. O., 3rd ser., 5: 725 (1925).

FILTERS AND FILTRATION

ALLIOTT, EUSTACE E. Filtration, centrifugal dryers and separators. Trans. Inst. Chem. Eng. 1: 109-120 (1923).

BÜHLER, F. A. Filtern und Pressen. 2. Aufl. Leipzig, Spamer, 1921. 172 p. Patents, p. 121-169.

HOUBEN, J. Filtrieren. In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 427-453 (1925). Bibl. footnotes.

OVERBECK, W. Die neuzeitliche Membranfiltration. Chem. App. 13: 14-16 (1926). 31 footnotes.

ZSIGMONDY, R. Ueber feinporige Filter und neue Ultrafilter. Z. angew. Chem. 39: 400-401 (1926). 45 references.

See also ULTRA-FILTRATION.

FIRE PREVENTION *

NATIONAL FIRE PROTECTION ASSOCIATION. Publications on the subjects of fire prevention and fire protection available in the files, and Index to subjects covered in the printed records corrected to September 30, 1926. Boston, Mass., National Fire Protection Association, 1926. 87 p.

See also PETROLEUM.

FISH

Fish as food. Index-Cat. S. G. O., 3rd ser., 5: 761-762 (1925).

UNITED STATES. Bureau of Fisheries. Nutritive value of fish and shellfish. U. S. Bur. Fisheries. Doc. 1000. 1926. 53 p. Bibl., p. 549-552.

FLASH POINT

THOMPSON, NORMAN J. Auto-ignition temperature of flammable liquids. Ind. Eng. Chem. 21: 139 (1929). 35 references.

FLAVINE *

Flavine. Index-Cat. S. G. O., 3rd ser., 5: 787 (1925).

FLAVORING MATERIALS *

COHN, G. Die organischen Geschmacksstoffe. Berlin, Siemenroth, 1914. 936 p. Bibl. footnotes.

See also VANILLA.

FLAX

LAZARKÉVICH, N. Le lin, sa culture et son industrie dans l'Europe occiden-

tale. Paris, Gauthier-Villars, 1925. 407 p. Bibl. at ends of 1.-3., 5. ptie.

RUSCHMANN, GERHARD. Grundlagen der Röste. Eine wissenschaftlich-technische Einführung für Bakteriologen, Landwirte, Röste, Spinner und Fachschüler. Leipzig, Hirzel, 1923. 188 p. Bibl., p. 174-180.

TOBLER, FRIEDRICH. Der Flachs als Faser- und Oelpflanze. Berlin, Springer, 1928. 273 p. Bibl., p. 253-268.

See also FIBERS; LINEN.

FLAX SEED *

COLEMAN, DAVID A., and FELLOWS, H. C. Oil content of flaxseed with comparisons of tests for determining oil content. U. S. Dept. Agr., Dept. Bull. no. 1471. 1927. 35 p. Bibl., p. 33-34.

PHILLIPS, C. L. Flaxseed. Abstracts and list of references of published reports. U. S. Dept. Agr. Bur. Agr. Econ. 1927. 37 p. Includes flaxseed and linseed oils.

FLINT.* *See* SAND (Weigel).

FLOCCULATION

HARDY, F. Anomalous flocculation in colloidal clays and soils. J. Phys. Chem. 30: 254-265 (1926). Bibl. footnotes.

See also COLLOIDS.

FLOTATION

Bibliography on flotation (1921-1926). Eng. Min. J. 122: 535-536 (Oct. 2, 1926).

FAHRENWALD, A. W. Surface reactions in flotation. Trans. Am. Soc. Min. Met. Eng. 70: 647-736 (1924). Bibl. footnotes.

KELLERMANN, K. Flotation. Kolloidchem. Z. 47: 268-278 (1929). 124 footnotes.

MAYER, ERWIN. Flotation. In Liesegang, Kolloidchem. Tech., 699-756 (1927). Bibl. footnotes.

Selective flotation. Eng. Min. J. 120: 823 (Nov. 21, 1925).

FLOUR

AMOS, PERCY A. Processes of flour manufacture. London, Longmans, 1925. 310 p. Bibl., p. 301-302. 70 references.

BAILEY, CLYDE H. The chemistry of wheat flour. N. Y., Chem. Cat. Co., 1925. 324 p. Bibl., p. 293-314.

DEDRICK, B. W. Practical milling. Chicago, National Miller, 1924. 576 p. Bibl. at end of Chapter 18.

Flour and its adulteration. Index-Cat. S. G. O., 3rd ser., 5: 795-796 (1925).

JOHNSON, A. H. Organic acid in dough. Cereal Chem. 2: 345-364 (1925). 24 references.

KENT-JONES, DOUGLAS W. A study of the effect of heat upon wheat and flour, especially in relation to strength. Dover, Eng., The Dover Print. & Publ. Co., 1926. 116 p. Bibl., p. 110-116.

PHILLIPS, C. LOUISE, and SHOLLENBERGER, J. H. Flour milling and bread making. U. S. Dept. Agr., Bur. Agr. Econ., Bibl. no. 2. 24 p. 1925. Mimeographed.

SHARP, PAUL F. Plasticity of simple flour-in-water suspensions. Cereal Chem. 3: 40-56 (1926). 31 references.

SHERWOOD, R. C. Control of diastatic activity in wheat flour. Thesis, University of Minnesota, 1925. 54 p. Bibl., p. 48-52.

SHERWOOD, R. C., and BAILEY, C. H. Control of diastatic activity in wheat flour. I. Production of diastatic flour and effect of large dosages. Cereal Chem. 3: 107-136 (1926). 60 references.

See also GLADIN; GLUTEN.

FLUIDITY. *See* PLASTICITY.

FLUORESCENCE

CHILD, C. D. Fluorescence of gases. International critical tables V: 391 (1929). 71 references.

Fluorescence. Index-Cat. S. G. O., 3rd ser., 5: 799 (1925).

See also CHEMILUMINESCENCE; LUMINESCENCE; PHOSPHORESCENCE.

FLUORINE

Fluor. Gmelin's Handb. anorg. Chem., 8th ed., Systemnummer 5. Leipzig, Verlag Chemie, 1926. 86 p. Literature up to June, 1926.

FLUORSPAR

DAVIS, HUBERT W. Fluorspar and cryolite in 1924. U. S. Geol. Surv., Mineral Resources, 1924, pt. 2: 74-76.

LADOO, RAYMOND B. Fluorspar: its mining, milling, and utilization with a chapter on cryolite. U. S. Bureau of Mines. Bull. 244. 1927. 185 p. Selected bibl. on fluorspar, p. 172-176; cryolite, p. 180.

FLUOSILICATES *

MELLOR, J. W. The fluosilicates. In his Inorg. theor. chem. 6: 958-960 (1925). 250 references.

FOAM SEPARATORS *

SCHROEDER, H. Die Schaumabscheider als Konstruktionsteile chemischer Apparate. Chem. App. 4: 97-99, 105-108, 113-116, 121-122, 129-132, 137-139, 146-149, 156-158, 164-166, 171-172, 180-182, 185-187; 5: 4-6, 9-11, 19-22, 51-53, 57-60 (1918). List of German patents; also separate, Leipzig, Spamer, p. 49-82. Annotated.

FOODS

- BURNETT, J. Institution handbook on feeding in educational institutions; a plea for standardization. Murfreesboro, Tenn., 1926. 96 p. Bibl., p. 94-96.
- CARLSSON, VICTORIA. A bibliography for cookery investigation problems. N. Y., Teachers College, Columbia Univ., 1927. 68 p.
- DAMON, SAMUEL R. Food infections and food intoxications. Baltimore, Williams and Wilkins, 1928. 266 p. Bibl. at end of chapters.
- DUKES, CUTHBERT. The bacteriology of food. London, Lewis, 1925. Bibls. at end of chapters.
- Food. Index-Cat. S. G. O., 3rd ser., 5: 818-830 (1925). Includes adulteration of, analysis of, artificial and synthetic, canned, cold storage, hygiene of, inspection of, poisoning by, preservation of, relative nutritional value of vegetable.
- HOAGLAND, RALPH, and SNIDER, GEORGE S. Nutritive value of the protein in voluntary muscle, heart, liver, and kidney, from cattle, sheep, and hogs. J. Agr. Research 32: 1039-1040 (1926).
- KESTNER, OTTO, and KNIPPING, H. W. Die Ernährung des Menschen; Nahrungsbedarf, Erfordernisse der Nahrung, Nahrungsmittel, Kostberechnung. Berlin, Springer, 1924. 136 p. Bibl., p. 130-131; bibl. footnotes.
- LEAGUE OF NATIONS. *Health organization*. The food of Japan. Geneva, 1928. 161 p. Literature relating to the chemical and physical properties of the food of Japan, p. 112-125.
- MAURIZIO, ADAM. Die Nahrungsmittel aus Getreide. Ihre botanischen, chemischen und physikalischen Eigenschaften, hygienisches Verhalten prüfen und Beurteilen. Handbuch für Studierende, Landwirte und den gesamten Getreidenahrung erzeugenden Gewerbestand. 2., neubearb. Aufl. Berlin, Parey, 1924. Bibl. footnotes.
- NATIONAL CONGRESS OF MOTHERS AND PARENT-TEACHER ASSOCIATIONS. *Georgia Branch*. P. T. A. interpretations of food; nutrition, efficiency, happiness; contributions, by P. T. A. members, arranged and supplemented by Mrs. J. D. Miller, director of the Home Service Department, Georgia Branch, National Congress Parents and Teachers. Atlanta, Ga., Walter W. Brown Publ. Co., 1928. 781 p. Contains bibls.
- OLCOTT, MARGARET I. World food supply. A selected bibliography. U. S. Dept. Agr., Library Bibl. Contr. no. 9. 1925. 68 p.
- OSTERTAG, R. v. Die Rohstoffe und Waren aus dem Tierreiche. In Grafe, Handbuch org. Warenkunde, 5, pt. 1: 239-278 (1928). Bibl. footnotes.
- PORTER, CHARLES S. Food for health, its preparation and combination. 3rd ed. Long Beach, Calif., C. S. Porter, 1927. 84 p. Books, p. 71-81.
- PRUDHOMME, CLAUDE. La question des halles et le problème actuel du ravitaillement de Paris. Thèse, Univ. de Paris, 1927. 221 p. Bibl., p. 219-221.
- RED CROSS. *Canada*. Canadian Red Cross Society. Food and health manual for classes in nutrition. Prepared by Ruggles George. Provisional ed. Toronto, The Canadian Red Cross Soc., 1924. 117 p. Bibl., p. 107-108.
- ROSE, MARY S. Laboratory handbook for dietetics. N. Y., Macmillan, 1929. 269 p. Bibl., p. 241-244.
- SAVAGE, W. G. Canned foods in relation to health. London, Cambridge Univ. Press, 1923. 152 p. Bibl., p. 137-144.
- SHERMAN, HENRY C. Chemistry of food and nutrition. 3rd ed. N. Y., Macmillan, 1926. 636 p. References at end of each chapter.
- SOCIETY OF CHEMICAL INDUSTRY. Foods. In Reports of the progress of applied chemistry 10: 524-542 (1925); 84 footnotes. 11: 542-565 (1926); 131 footnotes. 12: 559-590 (1927); 161 footnotes. 13: 565-587 (1928); 135 footnotes.
- STEINRUCK, AD. Die Chemie der Nahrungs- und Genussmittel in den Jahren 1922-1925. Chem.-Ztg. 50: 290-291, 314-317, 350-352, 359-361, 476-478, 526-528, 546-548, 554-556 (1926). 888 footnotes.
- STEINRUCK, AD. Die Chemie der Lebensmittel in den Jahren 1926 und 1927. Fortschrittsber. Chem.-Ztg., no. 3: 69-92 (1928). 926 footnotes.
- STROHECKER, ROBERT. Chemische technologie der Nahrungs- und Genussmittel. Leipzig, Spamer, 1926. 252 p. Bibl., p. 243.
- STROHECKER, ROBERT. Neuere Untersuchungen auf dem Gebiete der Lebensmittel-Chemie. Arch. Pharm. 266: 329-346 (1928). 113 footnotes.
- VULTÉ, HERMANN THEODORE, and VANDERBILT, SADIE B. Food industries; text-book on the production and manufacture of staple foods, for use in high schools and colleges. 5th ed. Easton, Pa., Chemical Publ. Co., 1928. 367 p. References at end of each chapter.

WELLMAN, MABEL T. Recent advances in knowledge of food selection and preparation. *J. Home Econ.* 11: 288-295 (1919). 44 references.

See also BANANA; DIET; METABOLISM; NUTRITION; OYSTERS; REFRIGERATION; VITAMINS.

FOODS: Analytical*

BLANCK, F. C. Bibliography on sampling foods. *J. Assoc. Off. Agr. Chem.* 10: 98 (1927). 16 references.

CATTELAINE, E. Les récentes fraudes et falsifications alimentaire, leur recherche par voie chimique. *J. Pharm. Chem.* 3: 518-520 (1926).

TILLMANS, JOSEPH. *Lehrbuch der Lebensmittelchemie*. Munich, Bergmann, 1927. 387 p. Bibl., p. 372-373.

FOODS: Dehydrated.

Kartoffelbaugesellschaft. Die Bedeutung der Trockenkartoffeln als Futtermittel. Berlin, Druck von Gebr. Unger, 1925. 42 p. Bibl., 2 p. at end.

NICHOLS, P. F., et al. Commercial dehydration of fruits and vegetables. *U. S. Dept. Agr., Dept. Bull.* 1335. 1925. 40 p. Bibl., p. 39-40.

FOODS: Preservation.

FELLERS, C. R. Public health aspects of food preservation. *Am. J. Public Health* 17: 470-475 (1927). 25 references.

LACY, MARY G. Bibliography on the preservation of fruits and vegetables in transit and storage, with annotations. *U. S. Dept. Agr., Bibl. Contr.* no. 4. June, 1922. 76 p. Mimeographed.

LEIGHTON, G. R. Botulism and food preservation. Collins, 1923. 237 p. Bibl., p. 212-230.

FORMALDEHYDE

ATWOOD, W. M. Physiological studies of effects of formaldehyde on wheat. *Bot. Gazz.* 74: 26-33 (1922). 58 references.

COULOUMA, JOSEPH. Formaldehyde. *Rev. gén. mat. plastiques* 4: 3-11, 73-85, 152-154, 263-272, 329-335 (1928). 81 references.

Formaldehyde. *Index-Cat. S. G. O.*, 3rd ser., 5: 866-868 (1925).

LEDBURY, W., and BLAIR, E. W. The production of formaldehyde by oxidation of hydrocarbons. *Gt. Brit., Dept. Sci. Ind. Research, Chem. Research, Special Report No. 1.* 1927. 54 p. Bibl., p. 53-54. 39 references.

NEUMANN, B., and BILJCEVIC, P. Die katalytische Herstellung von Formaldehyde. *Z. angew. Chem.* 40: 1469-1474 (1927). 37 footnote references.

ROELEN, O. Ueber die Verbrennung von Methan zu Formaldehyd. *Ges.*

Abh. Kenntnis Kohle 7: 111-115 (1925). Bibl. footnotes and list of patents.

SALMONY, —. Patentliteratur über Hexamethylentetramin und Hexamethylentetramin-Derivate. *Fortschrittsber. Chem.-Ztg.* no. 1: 27-28 (1928). Patents through text.

See also DISINFECTANTS; PLASTICS: SYNTHETIC.

FORMIC ACID

AUERBACH, FR., and ZEGLIN, H. Beiträge zur Kenntniss der Ameisensäure. I. Zur gravimetrischen Bestimmung der Ameisensäure. II. Die elektrolytische Dissoziation der Ameisensäure. III. Die Verteilung von Ameisensäure zwischen Wasser und Aether und deren Anwendung zu analytischen Zwecken. *Z. physiol. Chem.* 103: 161-177, 178-199, 200-237 (1925). Bibl. footnotes.

REUTER, ALBRECHT. Ameisensäure als Heilmittel und ihr Gebrauch am Krankenbett. Nach 12 jähriger eigener Erfahrung. Munich, Gmelin, 1925. 70 p. Bibl., p. 69-70.

FUELS

ANDREWS, G. W. Fuel. Coal, lignite and peat, by Henry Louis; fuel oils, by Arthur W. Eastlake; power alcohol, by W. R. Ormandy. London, Benn, 1923. 208 p. Bibl. at end of each section.

APPELL, P. Les économies de combustibles. Paris, Gauthier-Villars, 1923. 342 p. Bibl., p. 325-330.

AUBERT, M. Les combustibles liquides et le probleme du carburant national. Paris, Gauthier-Villars, 1924. 368 p. Bibl. footnotes.

CONTINENTAL MOTORS CORPORATION. Bus power; an analysis of the main factors involved in gasoline power for motor buses, illustrated by charts, views of motor details, factory processes and cost accounting forms. Detroit, Continental Motors Corp., 1925. 63 p. Bibl., p. 61-63.

EVANS, EDGAR C. Solid smokeless fuels, their properties and uses. *J. Soc. Chem. Ind.* 44: 383-391T (1925); *Chimie et industrie*, Special no.: 271 (Sept., 1926). 36 references.

HASLAM, ROBERT T., and RUSSELL, R. P. Fuels and their combustion. N. Y., McGraw-Hill, 1926. 809 p. Bibl. at end of each chapter.

Italy. *Direzione generale dei combustibili e servizi diversi*. Relazioni e studi del Comitato tecnico per l'utilizzazione dei combustibili nazionali. Roma, Tip. del Senato del dott. G. Bardi, 1923. 686 p. Bibl., p. 285-296.

FUELS—Cont'd

MILLER, A. E. Motorenbetriebsstoffe aus Kohle. *Petroleum* 24: 141-145 (1928). 122 reference.

PARR, S. W. Solid fuels. International critical tables II: 136 (1927). 42 references.

SINGER, L. Neuere über Triebmittel. *Petroleum* 25: 109-120, 152-153, 513-524 (1929). 466 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Fuel. In Reports on the progress of applied chemistry. 10: 23-37 (1925); 46 footnotes. 11: 22-48 (1926); 147 footnotes. 12: 25-41 (1927); 139 footnotes. 13: 35-65 (1928); 190 footnotes.

SPARROW, STANWOOD W. Fuels for high-compression engines. U. S. National Adv. Committee for Aeronautics, Rept. no. 232. 1925. 20 p. Bibl., p. 19-20.

STUMPER, R. Die Chemie der Bau- und Betriebsstoffe des Dampfkesselwesens. Berlin, Springer, 1928. 309 p. Bibl., 298-300.

THOMPSON, NORMAN J. Auto-ignition temperatures of flammable liquids. *Ind. Eng. Chem.* 21: 139 (1909). 35 references.

WILLIAMS-GARDNER, A. The "cracking" of paraffins. *Fuel in Science and Practice* 4: 340-440 (1925). 26 references.

Serial

"Monthly bibliography." In *Fuel in Science and Practice*, 1922 —.

See also COAL; COKE; GASOLINE; PETROLEUM; PEAT; ETC.

FUELS: Analysis.*

GILL, AUGUSTUS H. Gas and fuel analysis for engineers; a compend for those interested in the economical application of fuel, prepared especially for the use of students at the Massachusetts Institute of Technology. 10th rev. ed. N. Y., Wiley, 1925. 181 p. References at the end of some of the chapters.

KREULEN, D. J. W. Aperçu des méthodes proposées jusqu'à nos jours pour la détermination des matières volatiles dans les combustibles. *Bull. féd. ind. chim. Belg.* no. 4: 183-200, 255-273 (1925). 60 references.

FULLER'S EARTH

MIDDLETON, JEFFERSON. Fuller's earth. U. S. Geol. Surv., Mineral Resources, 1923, II: 105-107. 82 references.

FUMIGATION *

TURNER, ARTHUR J., and SEN, D. L. The use of hydrocyanic acid gas for the fumigation of American cotton

on import into India: experiments on its lethal power for the Mexican boll-weevil (*Anthonomus grandis*), and for the grain-weevil (*Sitophilus oryzae*); on the extent to which it is absorbed by cotton and jute respectively; and on a practical method for satisfactory fumigation on a large scale. India, Dept. of Agr., Memoirs, Entomological ser. Vol. X, no. 5. 1928. 97 p. Bibl., p. 146-152.

FUNGI

BRANNON, J. M. Influence of glucose and fructose on growth of fungi. *Botan. Gaz.* 76: 257-273 (1923). Bibl., p. 271-273. 31 references.

FUNGICIDES. See INSECTICIDES.

FUSION: Heat of *

DE FORCRAND, L., and GAY, L. Latent heat of fusion. International critical tables V: 135 (1929). 90 references.

GALACTOSE

Galactose. Index-Cat. S. G. O., 3rd ser., 5: 1013 (1925).

See also CARBOHYDRATES.

GALLIUM

FRICKE, R., and BLENCKE, W. Beiträge zur Chemie des Gallium. *Z. anorg. allgem. Chem.* 143: 198-200 (1925). 33 references.

GALLS: Plant.*

FIGDOR, W. Gallen. In Wiesner, Rohstoffe des Pflanzenreiches 1: 962-964 (1927). 94 references.

GALVANIZING *

BABLIK, HEINZ, JR. Galvanizing. London, Spon, 1926. 168 p. Bibl.: Electrolytes for electro-galvanizing, p. 124-125.

See also CORROSION (Rawdon).

GARNET

EARDLEY-WILMOT, V. L. Garnet occurrences and deposits in Canada. In Abrasives, pt. III. Garnet. (Canada, Dept. of Mines, Mines Branch, Publ. no. 677: 26-34.) 1927.

LADOO, R. B. Garnet. In his Non-Metallic Minerals, p. 255-256. 30 references.

See also ABRASIVES; ALUMINUM SILICATES.

GAS: Analysis.

RASSFIELD, P. Fortschritte in der Gasanalyse in den Jahren 1922-1927. Fortschrittsber. Chem.-Ztg., no. 1: 1-10 (1928). 303 footnotes.

SANDER, A. (New gas analytical apparatus and methods.) *Z. kompr. flüss. Gase* 23: 13-15; 51-54; 121-125; 133-136 (1923). References throughout text.

See also ORSAT APPARATUS.

GAS: Manufacture.

AMERICAN GAS ASSOCIATION. *Chemical Committee*. Recent progress in science in relation to the gas industry. New York, 1926. Bibls. at end of each section. These are entered in the proper section of this list.

BUREAU OF MUNICIPAL RESEARCH. Philadelphia's gas problem; a history of the Philadelphia gas works, a discussion of modern standards of gas service, and an analysis of the present situation. Philadelphia, Bureau of Municipal Research of Philadelphia, 1926. 149 p. Bibl., p. 146-149.

Entgasen und Vergasen; neuzeitliche Brennstofftechnik. Berlin, VDI-Verlag, 1926. 115 p. Bibl. footnotes.

FINN, C. P. The disposal of coke oven gas for public supply. *J. Soc. Chem. Ind.* 44: 356-357T (1925). 50 references.

FULWEILER, W. H. Utilization of bituminous coal in the manufacture of water gas. *Proc. Intern. Conference on Bituminous Coal*, 1926: 510-513. 45 references.

Illuminating gas. *Index-Cat. S. G. O.*, 3rd ser., 5: 1055-1056 (1925).

GWOSDZ, JOSEF. *Generatorgas*. Halle, Knapp, 1921. 191 p. Bibl. footnotes.

HACKFORD, J. E. Gas production from heavy fuel oils by partial combustion. *J. Soc. Chem. Ind.* 44: 299T (1925). Bibl. through text.

NASH, A. W. Recent developments in the formation of synthetic fuel from CO and H. *Chemistry and Industry* 45: 876-878 (1926). 18 references.

SCHILLING, E., and BUNTE, H. *Handbuch der Gastechnik*. 1919. Coal gas from coke plants, p. 89-90; water gas, p. 188-189; Generator gas and half water gas, p. 237-241; Suction gas generators, p. 241-242; By-products, p. 242-243; Oil gas, p. 259; Air gas, p. 282-283; Acetylene, p. 310; Natural gas, p. 320.

SOCIETY OF CHEMICAL INDUSTRY. Gas, carbonization, tar and tar products. In *Reports on the progress of applied chemistry* 10: 38-65 (1925); 131 footnotes. 11: 49-75 (1926); 167 footnotes. 12: 44-74 (1927); 152 footnotes. 13: 66-91 (1928); 148 footnotes.

See also COAL: CARBONIZATION; FUELS.

GAS: Natural.

CLAPP, F. G., *et al.* Petroleum and natural gas resources of Canada. Can. Dept. of Mines, Mines Branch no. 291. 2 v. 1914. Bibl., v. 1: 345-359.

CZAKÓ, E. Tabellarische Zusammenstellung von Erdgasanalysen. In

Engler and Hoefler, *Das Erdoel*, 4: 315-327 (1916).

See also GASOLINE; HELIUM (Elsworth).

GAS: Purification.

ALMQUIST, J. A., and DODGE, R. L. Purification of gas mixtures. *Chem. Met. Eng.* 33: 89-92 (1926). Bibl., p. 92. 58 references.

BRUCKNER, H. Die technischen Verfahren der Entschwefelung von Gasen. *Gas u. Wasserfach* 72: 442-445 (1929). 28 footnotes; 85 patents.

CRABTREE, FREDERICK, and POWELL, A. R. Sulfur in producer gas. *Trans. Am. Inst. Min. Met. Eng.* 63: 717-722 (1919). 40 footnotes.

SILBERMANN, HENRI. Elektrische Behandlung von Gasen; Aktivierung, Entstäubung, Umsetzung. 1922. Patents, p. 347-348.

WAESER, BRUNO. Die Entschwefelung von Gasen. *Chem.-Ztg.* 52: 638-640, 658-659 (1928). 32 footnotes.

WOLFFRAM, H. Die Entwicklung der Gasreinigung. *J. Gasbeleucht* 54: 299-305, 323-329 (1911). 101 footnotes.

GAS HYDRATES *

SCHROEDER, W. Die Geschichte der Gashydrate. *Sammlung chem. chem.-tech. Vorträge* 29: 1-98 (1926). Bibl. footnotes.

GAS LAW *

Lois des gaz. In *Tables annuelles V*: 312-324 (1917-1922); VI: 180-214 (1923-1926).

GAS METERS *

BEAN, HOWARD S. Gas measuring instruments. *Circ., Bur. Standards*, no. 309. 1927. 109 p. Bibl., p. 102-109.

GASES

ANGERSTEIN, JOH. Darstellung, Reinigung und Einleitung einiger Gase. In *Houben-Weyl, Meth. org. Chem.*, 3rd ed., 1: 731-748 (1925). Bibl. footnotes.

BLANCHARD, MARION S., and PICKERING, S. F. A review of the literature relating to the normal densities of gases. U. S. Bur. Standards, Sci. Paper no. 529. 1926. 145 bibl. footnotes. 30 gases discussed.

BURNET, EARLE S. The Joule-Thompson effect in carbon dioxide; an experimental study. *Bulletin of the Univ. of Wisconsin, Eng. ser.*, Vol. IX, no. 6. 1926. 103 p. Assembled references, p. 96-97.

Gases. *Index-Cat. S. G. O.*, 3rd ser., 5: 1057-1062 (1925). Includes poisoning by.

GREENWOOD, H. C. Industrial gases. London, Bailliere, 1920. 371 p. Bibls. at end of chapters.

GASES—Cont'd

LOEB, LEONARD B. Kinetic theory of gases, being a text and reference book whose purpose is to combine the classical deductions with recent experimental advances in a convenient form for student and investigator. N. Y., McGraw-Hill, 1927. 555 p. References and books recommended at end of each chapter.

LOEB, LEONARD B. Properties of carriers of free electricity in gases. International critical tables VI:117-119 (1929). 162 references.

MATHIAS, E., and CROMMELIN, C. A. Work done in the Leiden cryogenic laboratory concerning the equation of state of argon, neon and hydrogen between the third and fourth international congresses of refrigeration. Proc. 4th Intern. Congr. of Refrigeration 1:89-106 (1924). 75 references.

MOLES, E. Dieci anni di ricerche sui gas. Gazz. chim. ital. 56:915-947 (1926). 49 footnotes.

PICKERING, S. F. P-V-T relations in the gaseous state for substances which are gases at 0° and 1 atm. International critical tables III:16 (1928). 156 references.

PICKERING, SAMUEL F. A review of the literature relating to the critical constants of various gases. U. S. Bur. Standards, Sci. Paper no. 541. 1926. References for 32 gases through text.

PICKERING, SAMUEL F. Relations between the temperatures, pressures, and densities of gases. Circ. Bur. Standards no. 279. 1926. 85 p. Bibl., p. 62-85.

GASES: Liquefaction.

DREWS, KURT. Verdichtete und verflüssigte Gase. Halle, Knapp, 1928. 347 p. Bibl. footnotes.

SCHALL, M. Verdichtete und verflüssigte Gase. Hannover, Jaencke, 1910. List of German patents, p. 148-166.

WIRKNER, C. G. V. Ueber die wissenschaftlichen Arbeiten auf dem Gebiete der Compression und Verflüssigung der Gase. Z. kompr. flüss. Gase 1:50-54, 71-75, 103-108 (1897). Bibl. footnotes.

See also AIR: LIQUID.

GASES: Mine. *See* MINE GASES.**GASES: Poisonous.**

HENDERSON, YANDELL, and HAGGARD, HOWARD W. Noxious gases and the principles of respiration influencing their action. N. Y., Chem. Cat. Co., 1927. 220 p. Bibl. at end of most of the chapters.

See also CHEMICAL WARFARE.

GASES: Solubility.*

BAKER, EDWIN M. Theory of gas absorption in counter current apparatus. Trans. Am. Inst. Chem. Eng. 15, pt. 1:212-216 (1924).

LOOMIS, A. G. Solubilities of gases in non-aqueous pure liquids. International critical tables III:270 (1928). 141 references.

LOOMIS, A. G. Solubilities of gases in water. International critical tables III:261 (1928). 111 references.

NEAVE, S. L. Solubility and rate of solution of gases. Bibliography. Illinois State Water Survey, Bull. no. 19, 1924. 49 p. 333 titles, annotated. Material also indexed under: Solubility data, rate of adsorption, analytical methods, significance of dissolved gases.

SMITH, DAVID F. Solubility of gases in solutions. International critical tables III:283 (1928). 152 references.

GASOLINE

OBERFELL, GEORGE G., and ALDEN, R. C. Natural gasoline, testing, manufacturing and properties. Chicago, Conkey, 1924. 533 p. Bibl., p. 509-525. About 350 references.

See also FUELS; HYDROCARBONS (Naphthali); PETROLEUM.

GELATIN

ALEXANDER, JEROME. Adhesives and gelatines. International critical tables II:230 (1927). 54 references.

Gelatin. Index-Cat. S. G. O., 3rd ser., 6:6-8 (1926).

IZAGUIRRE, R. DE. Ueber den Einfluss der Zeit auf die physikalisch-chemischen Eigenschaften der Gelatine-lösungen. Kolloid-Z. 33:337-347 (1923). 26 footnotes.

KUHN, ALFRED. Die Quellung der Gelatine in wässrigen Lösungen organischer Säuren. Kolloidchem. Beihefte 14:147-208 (1921). Bibl. footnotes.

SAUER, E. Leim und Gelatine. In Liesegang, Kolloidchem. Tech., 830-880 (1927). Bibl. footnotes.

See also ADHESIVES; GLUE.

GELS. *See* COLLOIDS.**GELSEMIUM***

Gelsemium. Index-Cat. S. G. O., 3rd ser., 6:10 (1926). 14 references.

GEOCHEMISTRY

BEIRED, FRITZ, and BERG, GEORG. Chemische Geologie. Stuttgart, Enke, 1927. 595 p. Bibl. footnotes.

NÖLKE, FRIEDRICH GERHARD KONRAD. Geotektonische Hypothesen. Eine kritische Zusammenstellung. Berlin, Borntraeger, 1924. 128 p. Bibl., references.

VERNADSKY, VLADIMIR IVANOVICH. La géochimie. Paris. Librairie Félix Alcan, 1924. 403 p. Bibl. footnotes.

GERMANIUM

DENNIS, L. M. Germanium. Zusammenfassung der Untersuchungen im Dept. of Chem., Cornell Univ., 1921-1927. Z. anorg. allgem. Chem. 174: 97-141 (1928). Bibl., p. 140-141.

MELLOR, J. W. Germanium. In *his* Inorg. theor. chem. 7: 254-275 (1927). Bibl. through text.

GERMINATION

BECKER, ADALBERT. Ueber den Einfluss der Samenbehandlung mit Reizchemikalien auf die Keimung und das Wachstum. Landw. Jahrb. 63: 554-556 (1926). 79 references.

KANZLER, LUDWIG. Beiträge zur Physiologie der Keimung und der Keimlinge. Diss., Weihenstephan, 1925. 58 p. Bibl., p. 57-58.

TOOLE, EBEN H. The transformations and course of development of germinating maize. Am. J. Bot. 11: 348-350 (1924). 55 references.

GLASS

BRADLEY, W. P., and BROWNE, A. W. Resistance of glass tubing to bursting pressure. J. Phys. Chem. 8: 55 (1904); Z. kompr. flüss. Gase 8: 26 (1904). 13 footnotes.

BUCKLEY, F. History of old English glass. Dingwall-Rock, N. Y., 1925. 154 p. Bibl., p. 119-138, 142-151.

GOULDING-BROWN, H. Use of boric oxide in glass. N. Y., Pacific Coast Borax Co., 1924. 57 references.

HODKIN, FREDERICK WM., and COUSEN, A. A textbook of glass technology. London, Constable, 1925. 551 p. Bibl., p. xi-xiv.

HUETTIG, G. F. Appareils à plaques de verre poreux soudé par fusion. Chimie et industrie 20: 1037-1038 (1928). 100 references.

KIRCH, T. E. A classified list of German patents on glass. Glass Ind. 7: 91-93 (1926).

KIRCH, T. E. Classified list of the United States patents on glass. Glass Ind. 6: 221-223, 254-255 (1925).

LIESEGANG, RAPHAEL ED. Glas. In *his* Kolloidchem. Tech., 634-674 (1927). Bibl. footnotes.

LIESEGANG, RAPHAEL ED. Glas. Kolloid-Z. 44: 251-258 (1928). 78 footnotes.

List of books on glass. J. Am. Ceram. Soc. 8: 239-247 (1925). 204 titles.

MELLOR, J. W. Glass. In *his* Inorg. theor. chem. 6: 544-553 (1925). About 1,300 references.

MOREY, GEORGE W. Properties of glass. International critical tables II: 106 (1927). 70 references.

MYLIUS, WERNER. Glasforschung und Glastechnik im Jahre 1927. Keram. Rund. 36: 43-44, 86-88, 103-105, 182-185, 223-226 (1928). 125 references.

REBECK, J. W., MULLIGAN, M. J., and FERGUSON, J. B. The electrolysis of soda-lime glass. II. J. Am. Ceram. Soc. 8: 337-338 (1925). 38 references.

SCHULTZ, HANS. Das Glas. Munich, Kossel, 1923. Bibl., p. 168-176.

SOCIETY OF CHEMICAL INDUSTRY. Glass. In Reports on the progress of applied chemistry 10: 220-233 (1925); 76 footnotes. 11: 199-216 (1926); 83 footnotes. 12: 201-217 (1927); 92 footnotes. 13: 216-231 (1928); 115 footnotes.

TURNER, W. E. S. Chemical durability of glass. International critical tables II: 113-114 (1927). 58 references.

TURNER, WM. E. S. The physical properties of glasses. The relationship to chemical composition and mode of preparation. J. Chem. Soc. 1926: 2116. 33 references.

ZSCHIMMER, E. Calculation of glass constants. J. Soc. Glass Tech. 12: 82-118, 333-366 (1928). Bibl. footnotes.

ZSCHIMMER, E. Theorie der Glasmelztechnik als physikalisch-chemische Technik. Jena, Thüringer Verlagsanst. u. Druckerei, 1924. 208 p. Bibl. footnotes.

See also CERAMICS; SILICATES.

GLASS: Laminated.

ROSSMAN, JOSEPH. American and foreign patents on safety glass. Glass Ind. 10: 35 (1929).

ROSSMAN, JOSEPH. Manufacture of laminated glass. Glass Ind. 10: 1-6, 28-34, 57-64, 88-90 (1929). Patent review.

GLIADIN

DILL, D. B., and ALSBERG, C. L. Preparation, solubility and specific rotation of wheat gliadin. J. Biol. Chem. 65: 303-304 (1925). 37 references.

See also PROTEINS.

GLOBULIN

Globulins. Index-Cat. S. G. O., 3rd ser., 6: 100-101 (1926).

See also FIBRIN; PROTEINS.

GLUCOSAMINE

Glucosamin. Index-Cat. S. G. O., 3rd ser., 6: 104-105 (1926). 14 references.

GLUCOSE

AMICK, CHESTER A. The copper number for glucose. J. Phys. Chem. 31: 1441-1477 (1927). Bibl. footnotes.

GLUCOSE—Cont'd

Glucose. Index-Cat. S. G. O., 3rd ser., 6:105-106 (1926).

IONESCU, AL., and SPIRESCU, ELSIE. (Comparison of some chemical methods for the determination of glucose.) Bull. soc. chim. Romania 6: 101-108 (1924). 48 references.

LEVENE, P. A. Active glucose. Chem. Reviews 5:14-16 (1928). 28 references.

See also CARBOHYDRATES.

GLUCOSIDES

Glucosides. Index-Cat. S. G. O., 3rd ser., 6:106-107 (1926).

PELISCH, JUAN. Contribución al estudio de los glucósidos cianogénéticos y el *Holocalyx balansae* Mich. Inst. bot. farinacol., Facultad de ciencias médicas de Buenos Aires, No. 41. 1920. 60 p. Bibl. footnotes.

GLUE

KISSLING, R. Fortschritte auf dem Gebiete der Leimindustrie. 1925. Chem. Umschau 32:149 (1926); 79 references. 1926. *Ibid.* 34:157-160 (1927); 99 references. 1927. *Ibid.* 35:110-111 (1928); 67 references.

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Chemie und Industrie des Leims. Fortschrittsber. Chem.-Ztg. no. 1:10-13 (1927). 207 footnotes.

SAUER, E. Leim und Gelatine. In Liesegang, Kolloidchem. Tech., 830-880 (1927). Bibl. footnotes.

See also ADHESIVES; GELATIN; LEATHER.

GLUTATHIONE *

HUNTER, GEORGE, and EAGLES, BLYTHE A. Glutathione. A critical study. J. Biol. Chem. 72:161 (1927). 19 references.

RANDOIN, LUCIE, and FABRE, RENÉ. Glutathion et avitaminose B chez le pigeon. Bull. soc. chim. biol. 9:1027-1070 (1927). Bibl. footnotes.

TUNNICLIFFE, H. E. Glutathione. Biol. Reviews 2:96 (1926). 20 references.

GLUTEN *

COLEMAN, DAVID A., *et al.* A comparison of some physical and chemical tests for determining the quality of gluten in wheat flour. J. Agr. Research 34:263-264 (1927).

DILL, D. B. Composition of crude gluten. Cereal Chem. 2:10-11 (1925). 29 references.

DILL, D. B., and ALSBERG, C. L. Some critical considerations of the gluten washing problem. Cereal Chem. 1:222-246 (1924). 24 references.

DUECKER, WERNER W. The influence of time and temperature on the

swelling of gluten. Thesis, Iowa State College of Agriculture and Mechanic Arts, 1926. 20 p. Bibl., p. 20.

GREWE, EMILY H. Glutenin in its relation to flour strength. Thesis, Univ. of Minnesota, 1926. 29 p. Bibl., p. 27-29.

LARMOUR, RALPH K. Comparative study of the glutelins of the cereal grains. J. Agr. Research 35:1118-1120 (1927).

GLYCEROL

Glycerol. Index-Cat. S. G. O., 3rd ser., 6:108-109 (1926).

GRAY, T. H. Historical development of distillation of glycerin. Proc. Chem. Eng. Group, Soc. Chem. Ind. 3/4:136-140 (1922). Annotated list of patents.

LAWRIE, J. W. Glycerol and the glycols. N. Y., Chem. Cat. Co., 1928. 447 p. Patents, p. 437-438. Bibl. footnotes.

See also FATS.

GLYCOCOLL

Glycocol. Index-Cat. S. G. O., 3rd ser., 6:109 (1926).

See also AMINO ACIDS.

GLYCOGEN

Glycogen. Index-Cat. S. G. O., 3rd ser., 6:109-111 (1926).

GLYCOLS

LAWRIE, H. W. Glycerol and the glycols. N. Y., Chem. Cat. Co., 1928. 447 p. Patents, p. 437-438. Bibl. footnotes.

SCHRADER, H. Die Industrie des Glykols. Z. angew. Chem. 42:541-546 (1929). 78 footnotes.

GLYCOLYSIS *

Glycolysis. Index-Cat. S. G. O., 3rd ser., 6:111-112 (1926).

See also METABOLISM (Lipschitz).

GLYCOSURIA

Glycosuria. Index-Cat. S. G. O., 3rd ser., 6:112-113 (1926).

JUNKERSDORF, P. Untersuchungen über die Phlorrhizinglucosurie. I. Hunger-Phlorrhizinversuche. II. Längerdauernde Hunger-Phlorrhizinversuche mit vergleichender Blut-, Harn- und Organalyse. Arch. ges. Physiol. 197:500-515 (1922-1923); 200:443-469 (1923). Bibl. footnotes.

MCCRUDEN, FRANCIS H. A proposed method of selecting risks among individuals with occasional glycosuria. In Life Ins. Med. (New England Mut. Life Ins. Co.) 1:92-118 (1926). 487 references.

See also DIABETES; URINE: SUGAR.

GOLD

BERNEWITZ, M. W. v. Gold and silver. *Min. Ind.* 33:266-353 (1924). *Bibl. footnotes.*

Gold (Colloidal). *Index-Cat.*, S. G. O., 3rd ser., 6:157 (1926).

WEIMARN, P. P. v. Studien über dispersoide Synthese des Goldes. I. *Kolloid-Z.* 33:228-247 (1923). 49 footnotes.

GOLD SILICIDES. See **SILICIDES.****GOSSYPOL**

GALLUP, WILLIS D. The gossypol content and chemical composition of cottonseeds during certain periods of development. *J. Agr. Research* 34:991-992 (1927).

SHERWOOD, FRANCIS W. Studies on gossypol; the gossypol and *d*-gossypol content of some North Carolina cottonseed meals. *J. Agr. Research* 32:800 (1926).

GRAPE JUICE*

CALDWELL, JOSEPH S. Some effects of seasonal conditions upon the chemical composition of American grape juices. *J. Agr. Research* 30:1175-1176 (1925). 62 references.

GRAPES

VON DER HEIDE, —. Studien über das Reifen der Trauben. *In Muspratt*, 4:986-987.

GRAPHITE

DONATH, ED. Zur Kenntniss und zur Literatur des Graphits. *Chem.-Ztg.* 52:589-590, 610-611, 650 (1928). 26 footnotes.

FERGUSON, H. G. Graphite. *U. S. Geol. Survey, Mineral Resources*, 1917, II:117-119; 1918, II:264-265.

LADOO, R. B. Graphite. *In his Non-metallic minerals*, p. 279-280. 30 references.

RINALDO, BINAGHI. Sulla grafitite. *Ann. chim. appl.* 14:71-102 (1924). 109 footnotes.

TYLER, PAUL M. Graphite. *U. S. Bur. Mines, Inform. Circ.* No. 6118. 1929. 45 p. *Bibl.*, p. 33-45. Mimeographed.

GRIGNARD REAGENTS. See **MAGNESIUM: ORGANIC COMPOUNDS.****GROWTH**

Growth (and development). *Index-Cat.* S. G. O., 3rd ser., 6:272-277 (1926). Includes effects of chemical and physical agents on; effects of nutrition on; experimental researches on.

LEVINE, HAROLD, and SMITH, ARTHUR H. Growth experiments on diets rich in fat. *J. Biol. Chem.* 72:237-238 (1927).

PIAT, S., and MALKOVSKY, K. M. Ursachen des Wachstum und der Zellteilung. *Protoplasma* 2:348-367 (1927). 403 references.

RIPPEL, AUGUST. Wachstumsgesetze bei höheren und niederen Pflanzen. *Naturw. u. Landw.* no. 3. 1925. 90 p. *Bibl.*, p. 83-88; 131 references.

ROBBINS, WM. J., *et al.* Growth. New Haven, Yale Univ. Press, 1928. 189 p. *Bibl.*, p. 173-182.

WINTERS, JET C., SMITH, ARTHUR H., and MENDEL, LAFAYETTE B. The effects of dietary deficiencies on the growth of certain body systems and organs. *Am. J. Physiol.* 80:592-593 (1927).

See also **DIET; METABOLISM; NUTRITION; VITAMINS.**

GROWTH: Plants.*

BRENCHLEY, WINIFRED E. Inorganic plant poisons and stimulants. 2nd ed. Cambridge, Univ. Press, 1927. 134 p. *Bibl.*, p. 108-127.

PFEIFFER, HANS. Das abnorme Dickenwachstum. Berlin, Borntraeger, 1926. 272 p. *Bibl.*, p. 211-244.

RUSSELL, EDWARD J. Soil conditions and plant growth. 5th ed. London, Longmans, 1927. 516 p. *Bibl.*, p. 467-493.

WAGNER, HEINRICH. Beziehungen des Wachstums der Pflanzen zur physikalischen Chemie. *Landw. Jahrb.* 62:808 (1925).

GUAIACOL

Guaiacol. *Index-Cat.* S. G. O., 3rd ser., 6:283 (1926). 28 references.

GUANASE. See **AMIDASE; ENZYMES.****GUANIDINE**

Guanidine. *Index-Cat.* S. G. O., 3rd ser., 6:284 (1926).

PELLIZZARI, G. (Guanidine.) *Mem. accad. naz. Lincei* 14:707-776 (1924). Summary of 34 papers by Pellizzari.

GUAYULE*

MARTINEZ, MAXIMINO. El guayule; folleto de propaganda. Tacubaya, D. F., Mexico, Imprenta de la Direccion de estudios geograficos y climatologicos, 1926. 35 p. *Bibl.*, p. 33-34.

See also **RUBBER.**

GUMS

ABBOTT, O. D. Utilization of pentoses by yeast and the composition of plant gums. *Mo. Agr. Expt. Sta., Research Bull.* 85:27-29 (1926).

BREHMER, W. V., and ZEISEL, S. Gummiarten. *In* Wiesner, *Rohstoffe des Pflanzenreiches* I:1018-1022 (1927). 242 references.

VANDER LAAN, JOSEPH W. Production of gutta-percha, balata, chicle

GUMS—Cont'd

and allied gums. U. S., Bureau of foreign and domestic commerce, Trade Promotion Series, No. 41. 1927. 72 p. Bibl., p. 71-72.

WIESNER, J., and ZEISEL, S. Gummiarten. In Wiesner, Rohstoffe des Pflanzenreiches 1: 51-150 (1914). Bibl. footnotes.

See also RESINS.

GUNCOTTON. See EXPLOSIVES; NITROCELLULOSE.

GUNITE*

MORRIS, CLYDE T., and SHANK, J. R. Gunite and concrete encasement to increase the strength of structural steel. Ohio State Univ., Eng. Expt. Sta., Bull. No. 37. 1928. 72 p. Bibl., p. 71-72.

SZILARD, ADALBERT. Das Torkretverfahren und seine technischen Probleme. Berlin, Springer, 1925. 65 p. Bibl., p. 64-65.

See also CONCRETE.

GUNPOWDER

ESCALES, R. Die Explosivstoffe. I. Schwarzpulver und Sprengsalpeter. 2nd ed. Leipzig, Veit, 1914. Bibl., p. 463-466; patents, p. 467.

See also EXPLOSIVES.

GUTTA PERCHA. See GUMS; RUBBER.

GYPSUM

WILDER, F. A. Gypsum. Mineral Ind. 33: 365-367 (1924); 35: 340 (1927).

See also FERTILIZERS.

HAFNIUM

CATTELAINE, E. Cettium ou hafnium? J. pharm. chim. 6: 515-522, 563-567 (1927). 47 references.

HEVESY, G. The discovery and properties of hafnium. Chem. Reviews 2: 39-41 (1925). 63 references.

LEE, O. IVAN. The mineralogy of hafnium. Chem. Reviews 5: 36-37 (1928). 45 references.

MELLOR, J. W. Hafnium. In his Inorg. theor. chem. 7: 166-173 (1927). About 80 references, p. 166-167.

PANETH, FRITZ. Ueber das Element 72 (Hafnium). Ergeb. exakt. Naturwissenschaften 2: 176 (1923). 42 references.

PETERS, FRANZ. Hafnium. In Gmelin-Kraut, Handb. anorg. Chem. VI, pt. 1: 785-801 (1928). Bibl. through text.

HALOCHROMY*

BLUMBERGER, J. S. PETRIES. Halochromy of triphenylmethane derivatives. Chem. Weekblad 23: 534-546 (1926). 40 references.

HALOGENS

KEMPF, RICHARD. Halogenverbindungen. In Houben-Weyl, Meth. org. Chem. 2nd ed., III: 789-925 (1923). Bibl. footnotes.

See also names of individual halogens.

HARDNESS

FRIEDERICH, ERNST. Ueber die Härte anorganischer Verbindungen und die der Elemente. Fortschritte Chem., Phys., physik. Chem. 18, no. 12, 44 p. 1926. Bibl. footnotes.

REIS, A., and ZIMMERMANN, L. Untersuchungen über die Härte fester Stoffe und ihre Beziehung zur chemischen Konstitution. Z. physik. Chem. 192: 298-358 (1922). Bibl. footnotes.

SACHS, G. Die Härtung der Metalle. Z. Metallkunde 17: 85-93 (1925); Mitt. kgl. Materialprüfungsamt, Special No. II: 99-114 (1926). Bibl. footnotes.

HEAT: Apparatus.*

STEINKOPF, WILHELM. Erhitzen. In Houben-Weyl, Meth. org. Chem., 3rd ed., I: 316-339 (1925). Bibl. footnotes.

HEAT: Physiological effects.*

ROLLIER, AUGUSTE. Heliotherapy with special consideration of surgical tuberculosis. London, Oxford Univ. Press, 1927. 318 p. Bibl., p. 296-314.

SUNDSTRÖM, E. S. Physiological effects of tropical climate. Physiol. Rev. 7: 354-362 (1927). 194 references.

HEAT INSULATION

AMERICAN SOCIETY OF REFRIGERATING ENGINEERING. *Insulation Committee.* Heat transmission of insulating materials; report of insulation committee, Annual meeting, 1922, rev. to 1924. 1924. Literature on thermometry, p. 25-26; bibl., p. 95-114. About 500 references, arranged chronologically.

CAMMERER, JOSEF S. Der Wärme- und Kälteschutz in der Industrie. Berlin, Springer, 1928. 276 p. Bibl., p. 273-276.

GRUNDHOFER, EDUARD FRANZ. Bibliography of heat transmission relating principally to insulating and building materials. Pa. State Coll., Eng. Expt. Sta., Bull. 33: 37-71 (1925). Many hundred references, from 1690 to 1925.

SCHOFIELD, F. H., and HALL, J. A. Thermal insulating materials for moderate and low temperatures. International critical tables II: 316 (1927). 60 references.

HEAT RAYS*

HENNING, F. Wärmestrahlung. Ergeb.

exakt. Naturwissenschaften 1: 173-174 (1922). 31 references.

HEAT TRANSFER *

BUTLER, J. B. Descriptive bibliography on oil and fluid flow and heat transfer in pipes. School Mines Met. Univ. Mo., Bull. Tech. Series 9, no. 4. 62 p. 1926.

HELIUM

ELWORTHY, R. T. Helium in Canada. Canada, Dept. of Mines, Mines Branch, No. 679. 1926. 64 p. "Helium sources in other countries," p. 9-11; "Bibliography of natural gas in Canada," p. 56; "Bibliography of helium resources and production," p. 64.

Helium. In Gmelin's Handb. anorg. Chem. 8th ed., 1926, System Nummer 1, p. 36-98.

PANETH, F., GEHLEN, H., and PETERS, K. Helium Untersuchungen, IV. Ueber den Heliumgehalt von Erdgasen. Z. anorg. allgem. Chem. 175: 383-401 (1928). 60 bibl. footnotes.

HEMATIN

Haematin. Index-Cat. S. G. O., 3rd ser., 6: 351 (1926).

Haemin. Index-Cat. S. G. O., 3rd ser., 6: 357 (1926). 27 references.

JAVILLIER, M. De l'hématine à la bilirubine et à l'urobiline. Bull. soc. chim. biol. 8: 697-703 (1926). 101 references.

HEMOGLOBIN

BARCROFT, JOSEPH. The significance of hemoglobin in submammalian forms of life. Physiol. Rev. 5: 616-617 (1925). 26 references.

Haemoglobin. Index-Cat. S. G. O., 3rd ser., 6: 360-363 (1926).

Haemoglobinuria. Index-Cat. S. G. O., 3rd ser., 6: 364-370 (1926).

See also BLOOD PIGMENTS.

HEMOLYSIS

BLUMENTHAL, GEORG. Hämolys. In Oppenheimer, Handb. Biochem. 3: 568-698 (1926). 1386 footnotes.

Haemolysins. Index-Cat. S. G. O., 3rd ser., 6: 371 (1926).

Haemolysis. Index-Cat. S. G. O., 3rd ser., 6: 371-374 (1926).

HAFFNER, F. Ueber den Mechanismus von Hämolysen und Agglutination durch Ionen. Arch. ges. Physiol. 196: 15-59 (1922). Bibl. footnotes.

ISRAËL, EDMOND JOSEPH. Sur l'hémolyse par le venin de cobra (mécanisme-applications à la clinique). Thèse, Univ. de Lille, 1921. 52 p. Bibl., p. 48-52.

MOND, RUDOLF. Die physiko-chemischen Grundlagen der unspezifischen

Hämolysen. Protoplasma 2: 126-134 (1927). 61 references.

SACHS, HANS, and KLOPSTOCK, ALFRED. Methoden der Hämolysenforschung. In Abderhalden, Handb. biol. Arbeitsm. XIII, pt. 2: 799-1030 (1927). Bibl. footnotes.

HEMP *

HEUSER, O. Der deutsche Hanf. Leipzig, Hirzel, 1924. 92 p. Bibl., p. 88-92.

HEUSER, O., et al. Hanf und Hartfasern. Berlin, Springer, 1927. 266 p. Includes bibliographies.

HERBS *

LEVEL, HILDA. The magic of herbs; a modern book of secrets. London, J. Cape, 1926. 320 p. Bibl., p. 309-316.

HEROIN

Heroin. Index-Cat. S. G. O., 3rd ser., 6: 699-700 (1926). 29 references.

See also MORPHINE.

HETEROCYCLIC COMPOUNDS

HOLLINS, C. The synthesis of nitrogen ring compounds. London, Benn, 1924. 423 p. Index of patents.

HEXAMETHYLENETETRAMINE. See FORMALDEHYDE.

HEXOSAMINES

LEVENE, PHOEBUS A. T. Hexosamines and mucoproteins. N. Y., Longmans, 1925. 163 p. Bibl., p. 150-156.

HIPPURIC ACID

MORGULIS, SERGIUS, PRATT, GEORGE P., and JAHR, HERMAN M. Hippuric acid synthesis as a test of renal function. Arch. Internal Med. 31: 116-144 (1923). 24 bibl. footnotes.

HISTAMINE

HILLER, ALMA. The effect of histamine on protein catabolism. I. Biol. Chem. 68: 844-846, 863-864 (1926). 87 references.

Histamine. Index-Cat. S. G. O., 3rd ser., 6: 755 (1926). 24 references.

PARSONS, ELOIS. Histamine as a constituent of secretin preparations. Am. J. Physiol. 71: 501 (1925).

HISTIDINE

Histidine. Index-Cat. S. G. O., 3rd ser., 6: 755 (1926). 24 references.

See also AMINO ACIDS.

HISTOCHEMISTRY *

PARAT, MAURICE. A review of recent developments in histochemistry. Biol. Rev. 2: 295-297 (1927). 46 references.

HISTONES

KOSSEL, ALBRECHT. The protamines and histones. London, Longmans, 1928. 107 p. Bibl., p. 97-104.

HISTORY

HOLMYARD, ERIC JOHN. Chemistry to the time of Dalton. London, Oxford Univ. Press, 1925. 128 p. Bibl., p. 126.

See also ALCHEMY.

HONEY

Honey. Index-Cat. S. G. O., 3rd ser., 6: 797-798 (1926).

HORMONES

ALLEN, EDGAR, and DOISY, EDWARD A. Avarian and placental hormones. *Physiol. Rev.* 7: 645-650 (1927). 217 references.

BARKER, LEWELLYS F. Endocrine glands in relation to infancy and childhood. *Am. J. Diseases Children* 35: 872-884 (1928). 36 footnotes.

COLLIP, B. Darstellung und Auswertung des Hormons der Nebenschilddrüsen. In *Abderhalden, Handb. biol. Arbeitsm.* V, pt. 3B: 819-822 (1928).

Hormones. Index-Cat. S. G. O., 3rd ser., 6: 807 (1926).

JENEY, A. v. Ueber die hormonale Regelung der Magenbewegungen. *Z. ges. exptl. Med.* 54: 707-708 (1927). 35 references.

LAQUER, FRITZ. Hormone und innere Sekretion. Dresden und Leipzig, Steinkopff, 1928. 136 p. Bibl., p. 110-134. 1218 references.

PARKES, A. S. Physiology of ovarian activity. *Biol. Rev.* 3: 252-260 (1928). 304 references.

RAAB, WILHELM. Hormone und Stoffwechsel (die Bedeutung der Hormone für den Stoffhaushalt tierischer u. pflanzlicher Organismen). Freising-München, Datterer, 1926. 195 p. Bibl., p. 165-195. 1231 references.

SCHULTEN, HANS. Das Hormon der Nebenschilddrüsen. *Klin. Wochschr.* 4: 2488 (1925). 27 references.

SEREJSKI, M., and JISLIN, SOPHIE. Endokrine Störungen und spezifische dynamische Eiweisswirkung. *Z. ges. exptl. Med.* 59: 331-332 (1928). 59 references.

THOMAS, ERWIN. Fötale Hormone, Austausch der Hormone bei Mutter und Frucht. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 9: 281-304 (1926). 62 footnotes.

UHLMANN, FR. Zur Kritik der Wertbestimmungsmethoden für Ovarialhormone. *Z. ges. exptl. Med.* 55: 503-504 (1927). 39 references.

WADEHN, F. Ueber Sexualhormone, insbesondere das Feminin. *Z. angew. Chem.* 41: 352-355 (1928). 35 footnotes.

HORNBLENDE. See **MAGNESIUM SILICATES.**

HUMIC ACID AND HUMUS

SALLER, F. J. Chemical composition of soil organic matter as related to its effectiveness. *J. Am. Soc. Agron.* 19: 407-409 (1927).

SCHAILE, OTTO. Kurzer Ueberblick über die Methoden der Humussäurebestimmung und einige vergleichende Untersuchungen derselben. *Landw. vers. Stat.* 105: 229 (1927).

WAKSMAN, S. A. Cellulose as a source of "humus" in the soil. *Cellulose-chemie* 8: 97-103 (1927). Review of recent work, including a bibliography.

WAKSMAN, S. A. The origin and nature of the soil organic matter or soil "humus." *Introductory and historical.* *Soil Science* 22: 152-162 (1926). 251 references.

HYDRATES

DHAR, N. R. Hydration von Ionen, Kolloiden und Gelen. *Z. Elektrochem.* 31: 261-283 (1925). Bibl. footnotes.

FRICKE, ROBERT. Ueber Molekül- und Ionenhydrate. *Z. Elektrochem.* 28: 179-181 (1922). 195 references.

LEMBERT, MAX E. Beiträge zur Konstitution der Hydrate. I. Zur Systematik der Hydrate salzartiger Verbindungen. *Z. physik. Chem.* 104: 101-146 (1923). Bibl. footnotes.

See also GAS HYDRATES.

HYDRAZINE

IZUME, SEIICHI, and LEWIS, HOWARD B. The influence of hydrazine and its derivatives on metabolism. III. The mechanism of hydrazine hypoglycemia. *J. Biol. Chem.* 71: 65-66 (1926). 41 references.

LEWIS, HOWARD B., and IZUME, SEIICHI. The influence of hydrazine and its derivatives on metabolism. II. Changes in the non-protein nitrogenous constituents of the blood and in the metabolism of injected glycine in hydrazine intoxication. *J. Biol. Chem.* 71: 48-49 (1926). 30 references.

MELLOR, J. W. Hydrazine or diamide. In *his Inorg. theor. chem.* 8: 321-323, 328 (1928).

HYDRAZO COMPOUNDS. See **DIAZO COMPOUNDS.**

HYDRAZOIC ACID *

MELLOR, J. W. Hydrogen azide, hydrazoic acid, or azoimide. In *his Inorg. theor. chem.* 8: 342-343, 355-356 (1928).

HYDRAZONES *

MINUNNI, GAETANO. Prodotti di ossidazione degli aldeidrazoni aromatici e le loro trasposizioni molecolari. *Gazz. chim. ital.* 57: 505-525 (1927). 53 footnotes.

HYDRIDES

GRIMM, H. C. Ueber Bau und Grösse der Nichtmetallhydride. *Z. Elektrochem.* 31: 474-480 (1925). Bibl. footnotes.

SMYTHE, J. A. Formation and decomposition of hydrides of the non-metals. *Proc. Univ. Durham. Phil. Soc.* 5: 239-258 (1915). Bibl.

See also HYDROGEN.

HYDROCARBONS

EGLOFF, GUSTAV., and SCHAAD, RAYMOND E. The oxidation of the gaseous paraffin hydrocarbons. *Chem. Reviews* 6: 138-141 (1929). 120 references.

NAPHTALI, MAX. Leichte Kohlenwasserstofföle. Die neueren Verfahren zur Gewinnung von Benzin und einigen Ersatzstoffen. Band I of Technische Entwicklung auf dem Gebiete der Kohlenwasserstofföle und Fette. Berlin, Verlag von M. Krayn, 1928. 580 p. 900 patents since 1921.

TIMMERMANS, J., and MARTIN, F. Étude de vingt hydrocarbures et dérivés halogénés. *J. chim. phys.* 23: 52-55 (1926).

HYDROCHLORIC ACID

Chlor und Wasserstoff. Chlorwasserstoff. In *Gmelin's Handb. anorg. Chem.* 8 Aufl., System Nummer 6 (1927): 86-183.

See also ACIDS, ALKALIS AND SALTS (Waeser).

HYDROFLUOSILICIC ACID *

MELLOR, J. W. Hydrofluosilicic acid and its salts. In *his Inorg. theor.* *Chem.* 6: 944 (1925). 30 references.

HYDROFLUOTITANIC ACID *

MELLOR, J. W. Hydrofluotitanic acid and the fluotitanates. In *his Inorg. theor. chem.* 7: 73-74 (1927). 50 references.

HYDROGEN

CROSSLEY, A. W. The preparation and commercial uses of hydrogen. *J. Soc. Chem. Ind.* 3: 1135-1143 (1914). References through text. Hydrogenation patents, p. 1142.

HÜTTIG, GUSTAV F. Zur Systematik der festen Metall-Wasserstoff Verbindungen. II. Studien zur Chemie der Wasserstoffes. *Z. angew. Chem.* 39: 74-75 (1926). 100 references.

KAUSCH, O. Neuere Vorrichtungen zur Herstellung von Wasserstoff. *Chem. App.* 2: 125-128, 141-144 (1915). Patents.

PAULING, LINUS. The application of the quantum mechanics to the structure of the hydrogen molecule and hydrogen molecule-ion and to related

problems. *Chem. Reviews* 5: 211-213 (1928). 45 references.

Wasserstoff. *Gmelin's Handbuch der anorganische Chemie*, 8 Aufl., System Nummer 2 (1927). 273 p. Bibl. through text.

See also HYDRIDES; HYDROGENATION.

HYDROGEN-ION CONCENTRATION

CLARK, WILLIAM M. The determination of hydrogen-ions; an elementary treatise on electrode, indicator and supplementary methods, with an indexed bibliography on applications. 3rd ed. Baltimore, Williams & Wilkins, 1928. 717 p. Bibl., p. 587-671.

DAVIDSON, JEHIEL. Effect of hydrogen-ion concentration on the absorption of phosphorus and potassium by wheat seedlings. *J. Agr. Research* 35: 345-346 (1927).

DAWSON, L. E. The pH with quinhydrone electrode. *Sugar (N. Y.)* 28: 211-214, 262-264, 310-313, 369, 370 (1926). A bibliography of 103 titles.

Hydrogen-ion concentration. *Index-Cat. S. G. O.*, 3rd ser., 6: 876-877 (1926).

KOPACZEWSKI, W. Les ions d'hydrogène; signification, mesure, applications, données numériques. 1926. Bibl. at end of each chapter.

LAMOTTE CHEMICAL PRODUCTS Co., Baltimore, Md. Pioneers and leaders in the commercial production of materials and equipment for the colorimetric determination of hydrogen ion concentration and for water analysis. 2nd ed. 1926. Contains references.

MCCLENDON, J. F., BISSELL, F. S., LOWE, E. R., and MEYER, P. F. Hydrogen ion concentration of the contents of the small intestine. *J. Am. Med. Assoc.* 75: 1638-1641 (1920). 44 references.

MISLOWITZER, E. Die Bestimmung der Wasserstoffionenkonzentration von Flüssigkeiten. Berlin, Springer, 1928. 378 p. Bibl., p. 339-370.

MÜLLER, FRIEDRICH. Entwicklung und Bedeutung des pH-Begriffes. *Z. angew. Chem.* 39: 1374 (1926). About 100 references.

PFEIFFER, HANS. Der gegenwärtige Stand der kolorimetrischen Azidimetrie in der Gewebephysiologie. *Protoplasma* 1: 459-465 (1926). 250 references.

REISS, PAUL. Le pH intérieur cellulaire. Paris, Les Presses universitaires de France, 1926. 134 p. Bibl., p. 126-132.

VINCENT, MAURICE. La concentration en ions hydrogène et sa mesure par la méthode électrométrique. Application aux variations de l'équilibre acide-

HYDROGEN-ION CONCENTRATION*Cont'd*

base du sang, à l'état physiologique et à l'état pathologique. Action de colloïdes électriques en injection intraveineuse. Paris, Hermann, 1924. 101 p. Bibl., p. 89-101.

ZINZADZE, SCHALWA R. Neue normale Nährlösungen mit stabiler Reaktion (pH) während der Vegetationsperiode. Landw. vers. Stat. 105: 330-332 (1927).

HYDROGEN PEROXIDE

FRIEND, J. N., and TWISS, D. F. Hydrogen peroxide. In Friend, Text-book inorg. chem. VII, pt. I: 324-350 (1924). Bibl. footnotes.

Hydrogen peroxide. Index-Cat. S. G. O., 3rd ser., 6: 875 (1926).

SPITALSKY, EUGEN, and PETIN, N. Ueber die Katalyse des Wasserstoff-superoxyds durch Eisensalze. Z. physik. Chem. 113: 161-198 (1924). Bibl. footnotes.

HYDROGEN SULFIDE

Hydrogen sulfide. Index-Cat. S. G. O., 3rd ser., 6: 876 (1926).

HYDROGENATION

LUSH, E. J. Catalytic hydrogenation. Notiz. chim. ind. 3: 361, 363, 365, 367, 369 (1928). 80 references.

WÖBLING, HANS. Die Hydrierung mit besonderer Berücksichtigung der Brennstoffe und ihrer Destillationsprodukte. Halle (Saale), Knapp, 1926. 101 p. Bibl., 1 leaf at end.

HYDROXIDES *

ADICKES, F. Neuere Arbeiten ueber die Hydroxide drei- und vierwertiger Elemente. Z. angew. Chem. 41: 1333-1336 (1928). 23 footnotes.

HYDROXYL GROUP *

GVR, JOSEPH. Die Hydroxylgruppe. In Houben-Weyl, Meth. org. Chem., 2nd ed., III: 1-102 (1923). Bibl. footnotes.

HYDROXYLAMINE

MELLOR, J. W. Hydroxylamine. In his Inorg. theor. chem. 8: 298-300, 304 (1928).

HYGIENE *

BOYD, MARK F. Preventive medicine. 3rd ed., Philadelphia, Saunders, 1928. 475 p. Bibl. at end of most of the chapters.

BROADHURST, JEAN. Home and community hygiene; a text-book of personal and public health. 4th ed. Philadelphia, Lippincott, 1929. 469 p. Bibl., p. 425-431.

FLÜGGE, KARL G. F. W. Carl Flügge's Grundriss der Hygiene für studierende und praktische Aerzte, Medizinal- und Verwaltungsbeamte. 10.

Aufl. Berlin, Springer, 1927. 714 p. Includes bibliographies.

GOTTSTEIN, A., et al. Handbuch der sozialen Hygiene und Gesundheitsfürsorge. Berlin, Springer, 1925. Contains bibliographies.

Hygiene. Index-Cat. S. G. O., 3rd ser., 6: 888-920 (1926).

LUCKETT, GEORGE S., and GRAY, H. F. The elements of public health administration. Philadelphia, Blakiston, 1923. 460 p. Bibl., p. 446-450.

MCCOMBS, CARL E. City health administration. N. Y., Macmillan, 1927. 524 p. Selected bibl., p. 503-511.

NEW YORK. Cleanliness Institute. Cleanliness, a list of recent publications. N. Y., 1928. 45 p.

PHELPS, EARLE B. The principles of public health engineering. N. Y., Macmillan, 1925. 265 p. References and collateral reading at end of most of the chapters.

ROSENAU, MILTON J. Preventive medicine and hygiene. With chapters upon mental hygiene, by Abraham Myerson; Sewage and garbage, by Gordon M. Fair; Vital statistics, by John W. Trask; Statistical methods, by Carl R. Doering; Conservation of vision, by J. Herbert Waite. 5th ed. N. Y., Appleton, 1927. 1458 p. Contains bibls.

SMILEY, DEAN FRANKLIN, and GOULD, ADRIAN G. Community hygiene. N. Y., Macmillan, 1929. 350 p. Bibl. at end of each chapter.

STOREY, THOMAS A. Group hygiene. Stanford Univ., Calif., 1929. 83 p. Bibl., p. 48-53.

WILLIAMS, JESSE FEIRING. Topical sources for "Personal hygiene applied." Philadelphia, Saunders, 1929. 97 p. Bibl., p. 21-78.

WOLFF, G. Neuere aus dem Gebiete der Gewerbehygiene. Fortschrittsber. Chem. Ztg. no. 4: 118-120 (1927).

HYOSCIN

Hyoscin. Index-Cat. S. G. O., 3rd ser., 6: 923 (1926). 33 references.

HYOSCYAMINE

Hyoscyamus and hyoscyamin. Index-Cat. S. G. O., 3rd ser., 6: 923-924 (1926). 26 references.

HYPNOTICS

Hypnotics. Index-Cat. S. G. O., 3rd ser., 6: 927-928 (1926).

See also PHARMACEUTICALS.

HYPOCHLORIC ACID

Hypochlorite. In Gmelin's Handb. anorg. Chem., 8th Aufl. System-Nummer 6: 265-296 (1927). Bibl. through text.

Unterchlorige Säure. *In* Gmelin's Handb. anorg. Chem., 8th Aufl. System-Nummer 6: 249-265 (1927). Bibl. through text.

HYPONITROUS ACID

MELLOR, J. W. Hyponitrous acid. *In* his *Inorg. theor. chem.* 8: 410, 417 (1928). About 100 references.

HYPOPHOSPHORIC ACID

MELLOR, J. W. Hypophosphoric acid. *In* his *Inorg. theor. chem.* 8: 931, 940 (1928). About 100 references.

HYPOPHOSPHOROUS ACID

MELLOR, J. W. Hypophosphorous acid. *In* his *Inorg. theor. chem.* 8: 878-879, 890-891 (1928).

ICE

BARNES, HOWARD T. Ice engineering. Montreal, Renouf Publ. Co., 1928. 364 p. Bibl., p. 354-364.

ICE CREAM *

FOY, A. C., and OLSON, N. E. Bacterial content of ice cream. *J. Dairy Sci.* 7: 355-356 (1924). 26 references.

SHERFY, CARRIE B., and SMALLWOOD, NELL W. Bibliography on ice cream, up to and including the year 1926. U. S. Dept. of Agriculture, Library. Bibl. Contributions no. 17. 1928. 291 p. Mimeographed.

TURNBOW, GROVER D., and RUFFETTO, LLOYD A. Ice cream; a textbook for student and manufacturer. N. Y., Wiley, 1928. 407 p. Contains bibls.

ICHTHYOL

Ichthyol. Index-Cat. S. G. O., 3rd ser., 6: 953 (1926). 19 references.

IMIDOSULFONIC ACID *

MELLOR, J. W. Imidosulphonic acid and its salts. *In* his *Inorg. theor. chem.* 8: 660 (1928). About 25 references.

IMMUNITY

BERGER, WILHELM. Die Versuche zur Isolierung und zur Analyse der Antikörper. *Klin. Wochschr.* 2: 1228. 100 references.

BOYDEN, ALAN A. The precipitin reaction in the study of animal relationships. *Biol. Bull.* 50: 105-107 (1926).

HEIDELBERGER, MICHAEL. Chemical nature of immune substances. *Physiol. Rev.* 7: 127-128 (1927). 57 references.

Immunity. Index-Cat. S. G. O., 3rd ser., 6: 971-980 (1926).

Immunization and immunotherapy. Index-Cat. S. G. O., 3rd ser., 6: 980-981 (1926).

PETERSEN, WM. F. Protein therapy and non-specific resistance. N. Y., Macmillan, 1922. 314 p. Bibl., p. 257-307.

PUTTER, ERICH. Antikörper gegen Biokolloide. *In* Oppenheimer, Handb. Biochem. 3: 357-509 (1925). 230 footnotes.

SCHIFF, F. Agglutination. *In* Oppenheimer, Handb. Biochem. 3: 262-356 (1925). 866 footnotes.

SCHIFF, F. Immunität gegen Bakterien und Protozoen. *In* Oppenheimer, Handb. Biochem. 3: 521-567 (1925). 278 footnotes.

SELIGMANN, E., and GUTFELD, F. v. Anaphylaxie und verwandte Erscheinungen. *In* Oppenheimer, Handb. Biochem. 3: 152-261 (1925). 441 footnotes.

WICHELS, PAUL. Ueber die Beeinflussung der Bluteiweisskörper durch parenterale Einverleibung antigener und nicht antigenen Substanzen. *Z. ges. exptl. Med.* 53: 314-316 (1927). 147 references.

INDICATORS

CLARK, MANSFIELD. Standard buffer solutions and acid-base indicators. International critical tables I: 91 (1926). 68 references.

CONN, HAROLD J. Biological stains, a handbook on the nature and uses of the dyes employed in the biological laboratory. 151 p. Bibl., p. 138-145.

CZAPSKI, E. Indikatoren. *In* Abderhalden, Handb. Biol. Arbeitsm. 1, pt. 1: 591-622 (1925). Bibl. footnotes.

KOLTHOFF, ISAAK M. Der Gebrauch von Farbenindikatoren, ihre Anwendung in der Neutralisationsanalyse und bei der colorimetrischen Bestimmung der Wasserstoffionenkonzentration. 2., verb. Aufl. Berlin, Springer, 1923. 220 p. Bibl. at ends of chapters.

NAEGELI, KARL. Ueber ein neues Indikatorprinzip in der Azidimetrie und Alkalimetrie. Trübungsindikatoren. *Kolloidchem. Beihefte* 21: 406-411 (1926). 251 references.

See also HYDROGEN-ION CONCENTRATION; PHTHALEINS.

INDIGO

HOLLINS, C. The synthesis of nitrogen ring compounds. London, Benn, 1924. Indigo, p. 89-148. Patents and bibl. footnotes.

MARTINET, J. Matières colorantes: l'indigo et ses dérivés. Paris, Ballière, 1926. 700 p. Numerous bibls. and patent references.

NEVYAS, JACOB, and LOWY, ALEX. The electrochemical reduction of indigo. *Trans. Am. Electrochem. Soc.* 50: 349-360 (1926). 21 footnotes.

See also DYES.

INDOLES

HOLLINS, C. The synthesis of nitrogen ring compounds. London, Benn, 1924. Indoles, p. 89-163. Patents and bibl. footnotes.

Indole. Index-Cat. S. G. O., 3rd ser., 6: 991-992 (1926).

INDUSTRIAL HAZARDS *

EGLI, KARL. Die Unfälle beim chemischen Arbeiten. Leipzig, Rascher, 1925. 261 p. Extensive bibl.

INK

GAMBLE, WILLIAM B. Chemistry and manufacture of writing and printing inks. A list of references in the New York Public Library. N. Y., 1926. 105 p. *Reprinted from* Bull. N. Y. Public Library 29: 579-591, 625-677, 706-741 (1925). 2127 references; 728 articles, the others patents.

UNITED STATES. *Bureau of Standards*. Inks, typewriter ribbons and carbon paper. (2nd ed.) March 5, 1925. Circ., Bureau of Standards, no. 95. 1925. 32 p. Bibl., p. 32.

WIJBOG, FRANK B. Printing ink; a history with a treatise on modern methods of manufacture and use. N. Y., Harper, 1926. 299 p. Bibl., p. 253-275.

INORGANIC CHEMISTRY

BADGER, WALTER L., and BAKER, E. M. Inorganic chemical technology. N. Y., McGraw-Hill, 1928. 228 p. References at end of most of the chapters.

BRÄUER, ADOLF, and D'ANS, J. Fortschritte in der anorganisch-chemischen Industrie. Berlin, Springer, 1921-1927. Vols. 1-3. Cover German patents.

CANNERI, GIOVANNI. I più recenti progressi della chimica inorganica. Giorn. chim. ind. appl. 7: 257-262, 342-345 (1925); 88 references. 10: 12-17, 73-77, 135-140 (1928); 103 references.

KLEMM, W. Fortschritte der anorganischen Chemie seit 1925. Z. angew. chem. 42: 467-479, 494-501 (1929). 237 footnotes.

NEUMANN, BERNHARD. Chemische Technologie der anorganischen Industriezweige. Braunschweig, Vieweg, 1926. Supplement to Muspratt. 2 Bd. Bibl. at end of some sections.

WAESER, BRUNO. Fortschritte der anorganischen Grossindustrie in den Jahren 1924-1926. Fortschrittsber. Chem.-Ztg. no. 2: 33-52; no. 3: 84-100 (1927). 1005 footnotes.

WALDEN, P., and AUDRIETH, L. F. Free inorganic radicals. Chem. Reviews. 5: 358-359 (1928). 48 references.

WERNER, ALFRED. Beitrag zur Konstitution anorganischer Verbindungen. Leipzig, Akad. Verlagsges. 1924. 96 p. Bibl. footnotes.

See also ACIDS, ALKALIS, SALTS; names of individual chemical compounds and properties.

INOSITE

NEEHAM, JOSEPH. Die physiologische Bedeutung der Cyclosen. Ergeb. Physiol. 25: 1-45 (1926). Bibl., p. 1-5.

See also PHYTIN.

INSECTICIDES

CAMPBELL, FRANK LESLIE. On the rôle of calcium hydroxide in hydrated lime-acid lead arsenate sprays. J. Agr. Research 32: 82 (1926).

CAMPBELL, FRANK LESLIE. The practicability of quantitative toxicological investigations on mandibulate insects. J. Agr. Research 32: 365-366 (1926).

ENGLISH, LESTER L. Some properties of oil emulsions influencing insecticidal efficiency. Illinois, Natural History Survey. Bull. 17: 256-258 (1928).

FLEMING, W. E. Fumigation of potting soil with carbon bisulfide for the control of the Japanese beetle. N. J. Agr. Expt. Sta., Bull. 380. 1923. 45 p. 77 references, p. 41-45.

FLEMING, W. E. The comparative value of carbon bisulfide and other organic compounds as soil insecticides for control of the Japanese beetle. N. J. Agr. Expt. Sta., Bull. 410. 1925. 29 p. 75 references, p. 26-29.

GRIFFIN, EDWARD L., RICHARDSON, CHARLES H., and BURDETTE, ROBERT C. Relation of size of oil drops to toxicity of petroleum-oil emulsions to aphids. J. Agr. Research 34: 737-738 (1927).

HEALD, F. D. Arsenical spray residue and its removal from apples and pears. Wash. Agr. Expt. Sta., Bull. 226: 99-100 (1928).

HERMAN, F. H. Recently developed insecticides. Their chemistry and specific actions. Can. Chem. Met. 9: 134-136 (1925). 28 references.

HOLLAND, E. B., DUNBAR, C. O., and GILLIGAN, G. M. Influence of form and proportion of lime used and of method of mixing on the resulting Bordeaux mixture. J. Agr. Research 34: 685-686 (1927). 20 references.

HOLLAND, E. B., DUNBAR, C. O., and GILLIGAN, G. M. The preparation and effectiveness of basic copper sulphates for fungicidal purposes. J. Agr. Research 33: 750-751 (1926).

- HOOD, CLIFFORD E. Fish oil, an efficient adhesive in arsenate-of-lead sprays. U. S. Dept. of Agr., Bull. 1439. 1926. 22 p. Bibl., p. 21.
- Insecticides. Index-Cat. S. G. O., 3rd ser., 6: 1132 (1926). 36 references.
- MCDONALD, C. C., ROARK, R. C., LA-FORGE, F. B., and KEENAN, C. L. Insect powder. U. S. Dept. Agr., Bull. 824. 1926. 94 p. Bibl., p. 78-94; 333 references.
- MCINDOO, N. E., and SIEVERS, A. F. Plants tested for or reported to possess insecticidal properties. U. S. Dept. Agr., Bull. 1201. 1924. 62 p. 95 references.
- MARTIN, HUBERT. The scientific principles of plant protection. London, Arnold, 1928. 316 p. Bibls. at end of sections.
- NEWCOMER, ERVAL J. Laboratory experiments with arsenicals in the control of the codling moth. J. Agr. Research 33: 329-330 (1926).
- RICHARDSON, CHARLES H., and SMITH, C. R. Toxicity of dipyriddyis and certain other organic compounds as contact insecticides. J. Agr. Research 33: 609 (1926).
- ROARK, R. C. Review of U. S. patents relating to pest control. U. S. Dept. Agr., Bureau of Chemistry and Soils, Insecticide Div. Vol. 1, no. 1 issued Jan., 1928. Monthly. Mimeographed.
- UPPAL, B. Toxicity of organic compounds to the spores of *Phytophthora colocasiae* Rac. J. Agr. Research 32: 1095-1097 (1926).
- VOGT, ERNST. Die chemischen Pflanzenschutzmittel, ihre Anwendung und Wirkung. Berlin, de Gruyter, 1926. 134 p. Bibl., p. 4.
- WARDLE, R. A., and BUCKLE, P. The principles of insect control. N. Y., Longmans, 1923. 295 p. Bibl., p. 251-276.
- WARDLE, ROBERT A. The problem of applied entomology. Manchester, Manchester Univ. Press, 1929. 587 p. Bibl., p. 520-561.
- See also BORDEAUX MIXTURE; CHLOROPICRIN; DISINFECTANTS; GERMICIDES.
- CORI, CARL F., and CORI, GERTY T. The fate of sugar in the animal body. VIII. The influence of insulin on the utilization of glucose, fructose and dihydroxyacetone. J. Biol. Chem. 76: 793-795 (1928). 54 references.
- GREVENSTUK, A., and LAQUER, ERNST. Insulin. Seine Darstellung, physiologische und pharmakologische Wirkung, mit besonderer Berücksichtigung seiner Wertbestimmung (Eichung). Ergeb. Physiol. 23, pt. II: 2-15 (1925). 594 references.
- Insulin. Index-Cat. S. G. O., 3rd ser., 6: 1139-1144 (1926).
- KAUFFMANN, COSLA O., and ROCHE, JEAN. Action de l'insuline sur la disparition de la glucose et les oxydations dans le sang *in vitro*. Bull. soc. chim. biol. 8: 653-654 (1926). 28 references.
- LEVINE, V. E., and KOLARS, J. J. The effect of insulin on the morphological blood picture, with a note on the relation of diet to the convulsions produced by insulin. Am. J. Physiol. 74: 695-707 (1925). 59 references.
- MACLEOD, JOHN J. R. Carbohydrate metabolism and insulin. London, Longmans, 1926. 357 p. Bibl. at end of each chapter.
- PENAU, —, and BLANCHARD, L. Chimie de l'insuline. Bull. soc. chim. biol. 8: 443-450 (1926).
- SCHMIDT, A. A., and SSAATCHIAN, R. L. Einfluss des Insulins auf dem morphologischen und chemischen Blutbestand. Z. ges. exptl. Med. 54: 217-218 (1927). 48 references.
- SIMONNET, H. L'insuline. État actuel de la question. Bull. soc. chim. biol. 6: 105-112 (1924). 113 references.
- STAUB, H. Insulin. Klin. Wochschr. 3: 101, 150 (1924). 150 references.
- STAUB, H. Insulin; Darstellung, Chemie, Physiologie und therapeutische Anwendung. 2. Aufl. Berlin, Springer, 1925. 177 p. Bibl., p. 164-177.
- TROCELLO, E. (Insulin therapy in diseases other than diabetes.) Rass. clin. terap. sci. affini 25: 235-248 (1927). 75 references.
- See also DIABETES.

INSULIN

- BEST, C. H. Recent work on insulin. Endocrinology 8: 628 (1924). 35 references.
- BRAUN, CHARLES E. Studies on the ultrafiltration and electrodialysis of insulin solutions. Thesis, Columbia University, 1925. 38 p. Bibl., p. 38.
- CAMPBELL, W. R., and MACLEOD, J. J. R. Insulin. Medicine 3: 292-308 (1924). About 300 references.

INTERFEROMETRY *

- HIRSCH, PAUL. Interferometrie. In Houben-Weyl, Meth. org. Chem. 3rd ed., I: 996-998 (1925). About 50 references.

INTERNAL PRESSURE

- RICHARDS, THEODORE W. A brief history of the investigation of internal pressures. Chem. Reviews 2: 344-348 (1926). 100 references.

INTERNAL SECRETIONS

DODDS, EDWARD C., and DICKENS, F. The chemical and physiological properties of the internal secretions. Oxford Univ. Press, 1925. 214 p. Bibl. at the end of each chapter.

VINCENT, SWALE. Current views on "internal secretions." *Physiol. Rev.* 7: 316-319 (1927). 99 references.

See also HORMONES.

INTESTINES

BRUGSCH, THEODOR. Dünndarm und seine Sekrete. In Oppenheimer, Handb. Biochem. 4: 558-576 (1924). 120 footnotes.

Intestines, effects of chemical and physical agents on. Index-Cat. S. G. O., 3rd ser., 6: 1163-1164 (1926).

Intestines, ferments and fermentation in. Index-Cat. S. G. O., 3rd ser., 6: 1167-1168 (1926). 27 references.

Intestines, secretions of. Index-Cat. S. G. O., 3rd ser., 6: 1192-1193 (1926).

SCHULZ, FR. N. Verdauungsdrüsen niederer Tiere. In Oppenheimer, Handb. Biochem. 4: 631-651 (1924). 111 footnotes.

See also DIGESTION.

INULIN

Inulin. Index-Cat. S. G. O., 3rd ser., 6: 1207 (1926). 23 references.

ROOT, HOWARD F., and BAKER, MARION L. Inulin and artichokes in the treatment of diabetes. *Arch. Internal Med.* 36: 126-145 (1925). 30 footnotes.

See also CARBOHYDRATES.

INVENTIONS*

CHAPLET, AUGUSTE. Pour l'inventeur. Méthodes de recherches. Inventions à réaliser. Brevets et marques. Renseignements pratiques indispensables à tous les techniciens. Paris, Dunod, 1926. 212 p. Bibl., p. 201-203.

See also PATENTS.

INVERTASE

ANDERSON, ROBERT S. The influence of the mutameric forms of glucose and of fructose on invertase action. Thesis, Columbia University, 1925. 45 p. Bibl., p. 46.

BODANSKY, OSCAR. Mutarotation as a factor in the kinetics of invertase action. Thesis, Columbia University, 1925. 29 p. Bibl., p. 29.

Invertase. Index-Cat. S. G. O., 3rd ser., 6: 1207-1208 (1926). 30 references.

SOTTERY, CONSTANTINE T. The study of the accelerating effect of glucose on invertase from honey. Thesis, Columbia University, 1925. 48 p. Bibl., p. 46-47.

WALLACE, EARL K. The influence of mercuric chloride on invertase action. Thesis, Columbia University, 1925. 70 p. Bibl., p. 70.

See also ENZYMES.

IODINE

FELLENBERG, TH. V. Das Vorkommen, der Kreislauf und der Stoffwechsel des Jods. *Ergeb. Physiol.* 25: 176-363 (1926). Bibl., p. 178-181.

Iodine (and compounds). Index-Cat. S. G. O., 3rd ser., 6: 1209-1213 (1926). Includes pharmacology of, therapeutic use of, toxicology of, and use as an antiseptic and disinfectant.

LIÉVIN, OMER. Les solutions alcalines d'iode. Paris, Hermann, 1923. 144 p. Bibl. footnotes.

LUNDE, GULBRAND. The geochemistry of iodine and its circulation in nature. *Chem. Reviews* 6: 60-61 (1929). 23 references.

MCCLENDON, J. F. The distribution of iodine with special reference to goiter. *Physiol. Rev.* 7: 253-258 (1927). 193 references.

MARINE, DAVID. Iodine in the treatment of diseases of the thyroid gland. *Medicine* 6: 140-141 (1927). 20 references.

OLESEN, ROBERT. Iodization of public water supplies for prevention of endemic goiter. *Public Health Reports* 42: 1366-1367 (1927).

PETRÉN, KARL. Iodine and morbus Basedow (Exophthalmic goiter). *Endocrinology* 11: 16-17 (1927). 28 references.

IODOFORM

Iodoform. Index-Cat. S. G. O., 3rd ser., 6: 1214 (1926). 38 references.

IONIZATION

BLOCH, LEON. Ionization et resonance des gaz et des vapeurs. 1925. (Recueil des conférences-rapports de documentation sur la physique, v. 11, 2 série). 223 p. Bibl., p. 197-219.

CROWTHER, JAMES A. Ions, electrons, and ionizing radiations. 4th ed. N. Y., Longmans, 1927. 328 p. References at the end of most chapters.

LAMER, VICTOR K. Recent advances in the ionization theory as applied to strong electrolytes. *Trans. Am. Electrochem. Soc.* 51: 507-555 (1927). 67 footnotes.

STUHLMAN, O., JR. Ionization of gases. International critical tables VI: 124 (1929). 71 references.

See also ELECTRICAL CONDUCTIVITY.

IPECAC*

Ipecacuanha. Index-Cat. S. G. O., 3rd ser., 6: 1218-1219 (1926). 27 references.

See also ALKALOIDS.

IRON: Alloys.

BENEDICKS, C., and LOFQUIST, H. Ueber das System Eisen-Sauerstoff. Z. Ver. deut. Ing. 71:1577 (1927). 23 references.

Bibliography on the influence of nickel and chromium on iron. British Cast Iron Research Assoc., Bull., Apr., 1925, p. 7-8. 37 references.

DESCH, C. H. Ferrous alloys. Equilibrium diagrams. International critical tables II: 449 (1927). 60 references.

HATFIELD, W. H., WOOLMAN, J., and PRIEST, O. Mechanical and thermal properties of cast iron and of steels containing C, Cr, Cr-V, Cu, Ni-Cr, Ni-Cu, Ni-V and V. International critical tables II: 518-519 (1927). 146 references.

HEYN, E. Die Theorie der Eisen-Kohlenstoff-Legierungen. Berlin, Springer, 1924. 185 p. Bibl., p. vi-viii. See also STEEL.

IRON: Chemistry.

BURGESS, G. K., and CROWE, J. J. Critical ranges A2 and A3 of pure iron. Bull. Am. Inst. Mining Met. Eng. 82: 2574-2575 (1913).

FRIEND, J. NEWTON. Iron and its compounds. In his Textbook inorg. chem. 9, pt. II (1925). 265 p. Bibl. footnotes.

Iron (and compounds). Index-Cat. S. G. O., 3rd ser., 6:1230-1232 (1926). Includes colloidal, estimation of, pharmacology of and therapeutics of.

STARKEY, R. L., and HALVORSON, H. O. Transformations of iron in nature. II. Importance of microorganisms in the solution and precipitation of iron. Soil Science 24: 401-402 (1927). 42 references.

WEVER, FRANZ. Ueber die Konstitution des technischen Eisens. Z. tech. Physik 6: 682-688 (1925). 42 footnotes.

WHITE, ALBERT E. Properties of ferrous metals at elevated temperatures as determined by short time tensile and expansion tests. In Congrès intern. pour l'essai des matériaux I: 461-462 (1928). 31 references.

YENSEN, T. D. Pure iron and allotropic transformations. Am. Inst. Mining Met. Eng., Tech. Publ. No. 185. 1929. Bibl., p. 15-16. 26 references.

See also BOILER PLATES.

IRON: Ores.

BEHAGHEL, GEORG. Die Eisen- und Manganerze Osteuropas. 1922. Contains many bibls.

HESEMANN, JULIUS. Die devonischen Eisenerze des Mittelharzes. Halle, Knapp, 1927. 56 p. Bibl., p. 54-56.

STIRNEMANN, ERNST. Ueber die Bildungsverhältnisse der Eisenerzlagerstätten im System Eisenchlorid-Wasser. Neues Jahrb. Mineral. Geol. 53, Beilage Bd., A: 59-94 (1925). Bibl. footnotes.

WAGNER, PERCY A. The iron deposits of the Union of South Africa. South Africa, Geol. Survey, Memoir no. 26. 268 p. Bibl., p. 206-207.

YOUNG, GEORGE A., and UGLOW, W. L. The iron ores of Canada, vol. I. British Columbia and Yukon. Canada, Geol. Survey, Economic Geol. series no. 3. 1926. 253 p. Bibl. references.

IRON AND STEEL: Metallurgy.

BENEDICKS, C., and LÖFQUIST, H. Present knowledge regarding slag (solid nonmetallic) inclusions in iron and steel. In Congrès intern. pour l'essai des matériaux I: 286-290 (1928).

BOLTOM, J. W. Bibliography on cast iron. Prepared for the use of the Committee on Cast Iron of the American Foundrymen's Association, 1927. Mimeographed. Annotated.

BOYLSTON, HERBERT M. An introduction to the metallurgy of iron and steel. N. Y., Wiley, 1928. 571 p. Contains bibliographies.

CAMMEN, LEON. Principles of metallurgy of ferrous metals, a manual for mechanical engineers. N. Y., The American Soc. of Mech. Engineers, 1926. 145 p. Bibl. at the end of each chapter.

Desulfurization of cast iron. Bull. Brit. Cast Iron Research Assoc. no. 15: 24-25 (1927). 31 references.

GEIGER, KARL. Handbuch der Eisen- und Stahlgiesserei. 2. Aufl. Berlin, Springer, 1925. Contains bibls.

GOERENS, P. Influence of cold-working on the properties of iron and steel. Carnegie School Mem. 3: 320-434 (1911). Bibl., p. 433-434.

LUDWIG, P. Streckgrenze, Kalt- und Warmsprödigkeit. Z. Ver. deut. Ing. 70: 379-386 (1926). Bibl. footnotes.

McCLELLAND, E. H. Current literature on ferrous metallurgy. Blast Furnace & Steel Plant 13: 114, 164-165, 207, 256, 293, 319, 405-406, 442-443, 485; 14: 185, 237 (1925-1926).

McCLELLAND, E. H. Review of iron and steel literature. A classified list of the more important books, serials and trade publications during the year; with a few of earlier date, not previously announced. Blast Furnace Steel Plant 8: 8-10 (1920); 9: 6-8 (1921); 10: 4-8 (1922); 11: 7-11 (1923);

IRON AND STEEL: Metallurgy—Cont'd
 12: 13-17 (1924); 13: 9-11 (1925);
 14: 49-51 (1926); 15: 5-9 (1927); 16:
 20-23, 33 (1928); 17: 94-98 (1929).
 Forging—Stamping—Heat Treating
 10: 5-9 (1924); 11: 87-89 (1925); 12:
 15-17 (1926); 13: 48-52 (1927); 14:
 55-59 (1928). Issued as reprints by
 the Carnegie Library of Pittsburgh.

MATHESIUS, W. Die physikalischen und
 chemischen Grundlagen des Eisenhüt-
 tenwesens. 2nd ed. Leipzig, Spamer,
 1924. 483 p. Bibl. footnotes.

OBERHOFFER, —. Das technische Eisen,
 Konstitution und Eigenschaften. 1925.

OSANN, BERNHARD. Lehrbuch der
 Eisenhüttenkunde; verfasst für den
 Unterricht, den Betrieb und das
 Entwerfen von Eisenhüttenanlagen.
 ed. 2. v. 1, 1923. Contains bibl. foot-
 notes. Bibl., v. 1: 163-171.

SCHLIPKÖTER, MAX. Wärmewirtschaft
 im Eisenhüttenwesen. Dresden und
 Leipzig, Steinkopff, 1926. 119 p.
 Bibl., p. 115-116.

SOCIETY OF CHEMICAL INDUSTRY. Iron
 and steel. In Reports on the progress
 of applied chemistry 10: 234-257
 (1925); 103 footnotes. 11: 252-268
 (1926); 69 footnotes. 12: 253-272
 (1927); 74 footnotes. 13: 251-290
 (1928); 270 footnotes.

SPRING, LA VERNE W. Non-technical
 chats on iron and steel, and their
 application to modern industry. New
 ed. N. Y., Stokes, 1927. 365 p. Bibl.,
 p. 352-360.

VEREIN DEUTSCHER EISENHÜTTEN-
 LEUTE. Werkstoff-Handbuch: Stahl
 und Eisen. Düsseldorf, Verlag Stahl-
 eisen m. b. H., 1927. Contains bibls.

WILLIAMS, C. E., BARRETT, E. P., and
 LARSEN, B. M. Production of sponge
 iron. Bur. Mines, Bull. 270. 1927.
 175 p. Bibl., p. 166-175. Includes
 patents. References also through text.

WOHRMAN, C. R. Inclusions in iron.
 Trans. Am. Soc. Steel Treating 14:
 575-579 (1928). 93 references.

IRON ARSENATES. See ARSENATES.

IRON ARSENIDES *

DOELTER, C. Arsenide des Eisens. In his
 Handb. Mineralchem. 4, pt. 1: 593-637
 (1926). Bibl. footnotes.

IRON SILICATES

MELLOR, J. W. Iron silicates. In his
 Inorg. Theor. Chem. 6: 922-931
 (1925). About 1,000 references.

IRON SILICIDES. See SILICIDES.

IRON SULFIDES *

DOELTER, C. Das kolloide Eisenbisulfid.
 (Melnikowit). In his Handb. Min-
 eralchem. 4, pt. 1: 583-593 (1926).
 Bibl. footnotes.

HENGLEIN, M. Markasit. In Doelter,
 Handb. Mineralchem. 4, pt. 1: 566-583
 (1926). Bibl. footnotes.

HENGLEIN, M. Pyrit. In Doelter,
 Handb. Mineralchem. 4, pt. 1: 527-565
 (1926). Bibl. footnotes.

HENGLEIN, M. Pyrrhotin (Troilit). In
 Doelter, Handb. Mineralchem. 4, pt.
 1: 499-526 (1926). Bibl. footnotes.

ISOPRAL.

Isopral. Index-Cat. S. G. O., 3rd ser.,
 6: 1235-1236 (1926). 21 references.

ISOPROPYL ALCOHOL

GRANT, DUDLEY H. Pharmacology of
 isopropyl alcohol. J. Lab. Clin. Med.
 8: 386 (1923). 15 references.

ISOTOPES

CURIE, MARIE. L'isotopie et les éléments
 isotopes. 1924. (Recueil des confer-
 ences-rapports de documentation sur
 la physique, v. 9, serie 2). 209 p.
 Bibl., p. 201-206. About 100 refer-
 ences.

JOOS, GEORG. Bericht über spektro-
 skopische Nachweise von Isotopen
 und die Frage des Zusammenhangs
 zwischen den Isotopen und den Tra-
 banten von Spektrallinien. Physik. Z.
 26: 362 (1925). 27 references.

KAOLIN

BAYLEY, WILLIAM S. The kaolins of
 North Carolina. North Carolina,
 Geol. Survey, Bull. no. 29. 1925. 132
 p. Bibl. footnotes.

KÄSTNER, FRITZ. Das Problem der
 Kaolinbildung. Sprechsaal 60: 278-
 281 (1927). 52 references.

PIETERS, H. A. J. (Dehydration of
 kaolin.) Thesis, Techn. Hoogeschool,
 Delft, 1928. 148 p. 334 references.

SKEEN, JOHN R. Effects of some elec-
 trolytes on kaolin and the probable
 relation to the soil. Soil Science 23:
 241-242 (1927).

See also ALUMINUM SILICATES.

KERATIN

BARRITT, J. The literature of keratin
 (the principal constituent of wool).
 J. Textl. Inst. 17: 126T (1926). 45
 references.

Keratin. Index-Cat. S. G. O., 3rd ser.,
 7: 149 (1928). 21 references.

MULLIN, C. E. Proteins in general and
 wool in particular. Am. Dyestuff Re-
 porter 15: 413-417 (1926). 28 refer-
 ences.

KEROSENE

Bibliography of kerosene and other oils
 used in gasoline engines. Trans. Soc.
 Automotive Eng. 8, pt. 1: 219-220
 (1913). 22 references.

See also PETROLEUM.

KETENES *

STAUDINGER, H. Die Ketene. Stuttgart, Enke, 1912. 154 p. Several hundred footnote references and bibl., p. 149-150.

KETONES

CORNUBERT, R. Contribution a l'étude des cyclanones et de la fonction cétone. Bull. soc. chim. 41: 541-605 (1927). Bibl. footnotes.

Ketones. Index-Cat. S. G. O., 3rd ser., 7: 155-156 (1928).

See also ALDEHYDES (Schmidt).

KETOSIS *

COHEN, PHILIP. Ketosis in childhood. Archiv. Pediatrics 43: 783-784 (1926). 47 references.

LEVINE, HAROLD, and SMITH, ARTHUR H. Studies on ketosis in the rat. J. Biol. Chem. 75: 22 (1927). 37 references.

KIDNEY

FLURY, FERDINAND. Die giftigen Abscheidungen der Tiere. In Oppenheimer, Handb. Biochem. 5: 687-738 (1925). 294 footnotes.

GALEHR, OTTO, and ITO, TADASHI. Ein experimenteller Nachweis der Bildung giftigen Harnsubstanzen in der Niere. Z. ges. exptl. Med. 55: 130-131 (1927). About 60 references.

Kidney, functional tests of. Index-Cat. S. G. O., 3rd ser., 7: 182-185 (1928).

Kidney, physiology of. Index-Cat. S. G. O., 3rd ser., 7: 221-223 (1928).

PINCUSSEN, LUDWIG. Chemie der Niere und Harnwege. In Oppenheimer, Handb. Biochem. 5: 437-445 (1924). 74 footnotes.

SCHULZ, N. Die Tätigkeit der Niere. In Oppenheimer, Handb. Biochem. 5: 611-686 (1925). 373 footnotes.

KIESELGUHR. See DIATOMACEOUS EARTH.

KINETIC THEORY

BLOCH, E. The kinetic theory of gases. London, Methuen, 1924. 192 p. Bibl., p. 176-178.

BOLTZMANN, L., and NABL, J. Kinetische Theorie der Materie. In Enzyklopaedie der mathematischen Wissenschaften V, pt. I: 493-557 (1907). 195 footnotes.

See also GASES.

KRYPTON

KRYPTON. In Gmelin's Handb. anorg. Chem., 8th ed., System Nummer I: 169-181 (1926). Bibl. through text.

See also AIR: LIQUID; RARE GASES.

LABORATORIES

Laboratories. Index-Cat. S. G. O., 3rd ser., 7: 406-408 (1928).

LACQUERS

BROWN, BRUCE K., and CRAWFORD, FRANCIS M. A survey of nitrocellulose lacquer. N. Y., Chem. Cat. Co., 1928. 368 p. Bibl., p. 249-278. 641 references.

CRAWFORD, FRANCIS M. A lacquer bibliography. Terre Haute, Ind., Commercial Solvents Corp., 1927. 36 p. 506 references.

CRAWFORD, FRANCIS M. References to recent work on nitrocellulose lacquers. Chem. Met. Eng. 32: 570-571, 635-636, 683-684 (1925).

German patents in the lacquer field. Chemical Markets 19, no. 7: 267-269; no. 9: 351-352 (June 24, July 8, 1926).

NELSON, HARLEY A., and NORRIS, WAYNE C. Pigments in nitrocellulose lacquer enamels. Research Bull. N. J. Zinc Co. 1927. 27 p. Bibl., p. 25-27. 58 references.

SCHULTZ, J. Farbstofftabellen. 6th ed. 2 vols. Berlin, Wiedmann, 1923. Bibl., p. 284-285.

SPROXTON, FOSTER. Cellulose ester varnishes. London, Benn, 1925. 178 p. Bibls. at end of chapters.

See also ENAMELS.

LACTIC ACID

ARNY, H. V., and DIMLER, M. C. Lactic acid tests. J. Am. Pharm. Assoc. 18: 462 (1929). 26 references.

LONG, C. N. H. The estimation of lactic acid in biological fluids. Proc. Roy. Soc. 96B: 454 (1924). 35 references.

LACTONES

OTT, ERWIN. Lactone. In Houben-Weyl, Meth. org. Chem., 2nd ed. III: 477-513 (1923). Bibl. footnotes.

LACTOSE

Lactose. Index-Cat. S. G. O., 3rd ser., 7: 425 (1928).

WHITTIER, E. O. Lactose. A review. Chem. Reviews 2: 118-125 (1925). About 250 references.

LATERITE

HARRASSOWITZ, HERMANN. Laterit; Material und Versuch erdgeschichtlicher Auswertung. Fortschritte der Geologie und Palaeontologie 4: 253-566 (1926). Bibl. references.

LATEX *

ALADIN, —. Latex, Konservierung und Konzentration. Gummi-Ztg. 43: 1047-1049, 1105-1106 (1929). 85 patents.

ROSSMAN, JOSEPH. Latex sizing by the beater method. Paper Trade J. 86, no. 22: 45-46 (May 31, 1928); Paper Makers' Mo. J. 66, no. 7: 310-313 (July, 1928).

STEVENS, H. P. Latex. London, Rubber Growers' Assoc., 1928. 66 p. Selected

LATEX—Cont'd

list of British patents, p. 48-64; Bibl., p. 65-66.

See also RUBBER.

LEAD

AUB, JOSEPH, *et al.* Lead poisoning. *Medicine* 4: 228-250 (1925). 500 references. *Reprinted in* 1926 by Bailliere, Tindall & Cox. 265 p.

Lead (effects of, estimation of, poisoning by). *Index-Cat. S. G. O.*, 3rd ser., 7: 507-515 (1928).

LEGGE, T. M., and GOADBY, K. W. Bleivergiftung und Bleiaufnahme. Berlin, Springer, 1921. 372 p. Bibls. at end of chapters.

MELLOR, J. W. Lead. *In his* *Inorg. theor. chem.* 7: 484-888 (1927). Many hundred references through text: History, 100 references; Occurrence, 300 references; Extraction, 900 references; Physical properties, 2000 references; Chemical properties, 1350 references; Atomic weight, 175 references.

REES, O. W., and ELDER, A. L. The effect of certain Illinois waters on lead. *J. Am. Water Works Assoc.* 19: 722-724 (1928). 39 references.

LEAD: Alloys.

MELLOR, J. W. Alloys of lead with the metals of the alkaline earths and of the magnesium zinc family. *In his* *Inorg. theor. chem.* 7: 621-624 (1927). 275 references.

MELLOR, J. W. The alloys of lead with aluminium, indium, thallium and tin. *In his* *Inorg. theor. chem.* 7: 632-636 (1927). 400 references.

MELLOR, J. W. The alloys of lead with copper, silver and gold. *In his* *Inorg. theor. chem.* 7: 612-613 (1927). 150 references.

MELLOR, J. W. The alloys of lead with the alkali metals. *In his* *Inorg. theor. chem.* 7: 608-609 (1927). 50 references.

See also ALLOYS.

LEAD: Metallurgy.

RALSTON, OLIVER C. Hydrometallurgy of lead. *Trans. Am. Soc. Min. Met. Eng.* 70: 447-466 (1924). Bibl. footnotes.

LEAD: Mining *

SCHUBRING, SELMA L. A statistical study of lead and zinc mining in Wisconsin. *Trans. Wisconsin Acad. Sci., Arts and Letters* 22: 83-95 (1926).

LEAD: Organic compounds *

CALINGAERT, GEORGE. The organic compounds of lead. *Chem. Reviews* 2: 82-83 (1925). 36 references.

See also METALLO-ORGANIC COMPOUNDS.

LEAD ARSENATES. *See* ARSENATES.

LEAD BROMIDES

MELLOR, J. W. Lead bromides. *In his* *Inorg. theor. chem.* 7: 755-757 (1927). 250 references.

LEAD CARBONATES

MELLOR, J. W. Lead carbonates. *In his* *Inorg. theor. chem.* 7: 839-841 (1927). 450 references.

LEAD CHLORIDES

MELLOR, J. W. Lead chlorides. *In his* *Inorg. theor. chem.* 7: 721-725 (1927). 600 references.

MELLOR, J. W. Lead oxychlorides. *In his* *Inorg. theor. chem.* 7: 744-745 (1927). 175 references.

LEAD FLUORIDES *

MELLOR, J. W. Lead fluorides. *In his* *Inorg. theor. chem.* 7: 706 (1927). 50 references.

LEAD HYDROXIDE *

MÜLLER, ERICH. Das System Bleihydroxyd, Bleioxyd, Plumbit und Natronlauge. *Z. physik. Chem.* 114: 129-156 (1924-1925). Bibl. footnotes.

See also LEAD OXIDES.

LEAD IODIDE

MELLOR, J. W. Lead iodide. *In his* *Inorg. theor. chem.* 7: 769-771 (1927). About 400 references.

LEAD NITRATES

MELLOR, J. W. Lead nitrates. *In his* *Inorg. theor. chem.* 7: 872-875 (1927). 450 references.

LEAD OXIDES

MELLOR, J. W. Lead suboxide or hemioxide; lead monoxide; lead hydroxide; the plumbites; the higher oxides of lead. *In his* *Inorg. theor. chem.* 7: 638, 643-644, 649-650, 658-660, 664-665, 669, 672, 679-680, 692-695, 701 (1927). 1,700 references.

See also LEAD HYDROXIDE.

LEAD PHOSPHATES *

MELLOR, J. W. Lead phosphates. *In his* *Inorg. theor. chem.* 7: 886-888 (1927). 325 references.

LEAD SILICATES. *See* SILICATES.

LEAD SULFATES

MELLOR, J. W. Lead sulphates. *In his* *Inorg. theor. chem.* 7: 824-828 (1927). 700 references.

LEAD SULFIDES

MELLOR, J. W. Lead sulphide. *In his* *Inorg. theor. chem.* 7: 797-803 (1927). 750 references.

SEEBACH, M. Bleiglanz. *In* Doelter, *Handb. Mineralchem.* 4, pt. 1: 403-424 (1926). Bibl. footnotes.

LEATHER

BURTON, D., and ROBERTSHAW, G. F. Bibliography on oils, fats and waxes.

- J. Intern. Soc. Leather Trades' Chem. 12: 490-505 (1928); J. Am. Leather Chem. Assoc. 24: 196-212 (1929). About 300 references, classified. Has special reference to sulfonated oils for leather manufacture.
- ENNA, F. G. A. Some applications of rubber to leather. J. Intern. Soc. Leather Trades' Chem. 12: 464-484 (1925). Bibl., p. 480-482 (104 references).
- GNAMM, HELLMUT. Die Fettstoffe in der Lederindustrie. Stuttgart, Wissenschaftliche Verlagsges. m. b. H., 1926. 597 p. Bibl. footnotes.
- KUBELKA, V., KÖHLER, B., and BERKA, F. Die Haut als Absorbens. III. Ueber die Absorption von Eisen- und Aluminiumchlorid durch Hautpulver. Kolloid-Z. 34: 48-61 (1924). 59 footnotes.
- NEWARK MUSEUM ASSOC., Newark, N. J. Nothing takes the place of leather. Newark, The Assoc., 1926. 32 p. Bibl., p. 21-25.
- PICKARD, C. E. Some scientific aspects of puering and bating. Chemistry and Industry 43: 480 (1924). 22 references.
- RAKUSIN, M. A. Die tierische Haut als amphoterer und kolloides Protein. Ein Beitrag zur Theorie der Färbung, Gerbung, Desinfektion und Konservierung des Leders, sowie der physiologischen Wirkung der Gerbstoffe. Kolloidchem. Beihefte 15: 103-184 (1922). Bibl. footnotes.
- SNOW, E. C. Leather, hides, skins and tanning materials. London, Benn, 1924. 368 p. Contains bibls.
- SOCIETY OF CHEMICAL INDUSTRY. Leather and glue. In Reports of the progress of applied chemistry 10: 639-661 (1925); 122 footnotes. 11: 426-451 (1926); 161 footnotes. 12: 423-453 (1927); 145 footnotes. 13: 446-468 (1928); 114 footnotes.
- WAGNER, A., and PAESSLER, JOHANNES. Handbuch für die gesamte Gerberei und Lederindustrie. 2 v. 1925. Bibl., v. 2: 1285-1287.
- WALTON, ROBERT P. Causes and prevention of deterioration in book materials. Bull. N. Y. Pub. Lib. 33: 235-266 (1929). Leather, p. 251-262; leather preservative compositions, p. 262-265; determination of acidity in leather, p. 265-266. Also issued as a separate. 39 p.
- WILSON, J. A. The chemistry of leather manufacture. 2nd ed. N. Y., Chem. Cat. Co., 1928. V. 1, 495 p. Bibl. at ends of chapters.
- See also TANNIC ACID AND TANNINS.
- LEATHER: Analytical.**
- FREY, R. W. Bibliography on sampling tanning materials and leathers. J. Assoc. Off. Agr. Chem. 10: 96-97 (1927). 10 references on tanning and 34 on leather.
- LECITHIN**
- Lecithin. Index-Cat. S. G. O., 3rd ser., 7: 521-523 (1928).
- MACLEAN, HUGH, and MACLEAN, IDA S. Lecithin and allied substances, the lipins. New ed. London, Longmans, 1927. 220 p. Bibl., p. 189-216.
- See also LIPOIDS.
- LEUCOCYTES ***
- WOLLHEIM, ERNST. Verteilungsänderungen der Leukocyten in der Blutbahn. Z. ges. exptl. Med. 53: 511-512 (1927). 93 references.
- LICHENS**
- KRASSER, F. Flechten. In Wiesner, Die Rohstoffe des Pflanzenreiches II: 115-134 (1918). Bibl. footnotes.
- LICORICE ***
- BEAL, GEORGE D., and LACEY, H. T. The history of licorice in pharmacy. J. Am. Pharm. Assoc. 18: 145-154 (1929). Bibl. footnotes.
- LIESEGANG PHENOMENON**
- DHAR, N. R., and CHATTERJI, A. C. Theorien der Liesegangringbildung. Kolloid-Z. 37: 2-9, 89-97 (1925). 61 footnotes.
- SCHLEUSSNER, C. Diffusionvorgänge in Gelatine. (Beiträge zur Kenntniss des Liesegang'schen Phänomens). Kolloid-Z. 31: 348-349 (1922). 53 references.
- LIGHT: Absorption.**
- POHL, ROBERT. Zur quantenhaften Lichtabsorption in festen Körpern. Naturwissenschaften 14: 219 (1926). 34 references.
- See also SPECTROSCOPY.
- LIGHT: Biological action.**
- LAURENS, HENRY. The physiological effects of radiation. Physiol. Rev. 8: 82-91 (1928).
- Light, effects of. Index-Cat. S. G. O., 3rd ser., 7: 653-655 (1928).
- Light, ultraviolet, effect of. Index-Cat. S. G. O., 3rd ser., 7: 656-659 (1928).
- SCHULTZ, F. W. Heliotherapy and actinotherapy in relation to pediatrics. Am. J. Diseases Children 32: 920-921; 33: 134-135 (1926-1927).
- See also PHOTOSYNTHESIS; PHOTOTHERAPY.
- LIGHT: Chemical action. See PHOTOCHEMISTRY.**

LIGNIN

DUPONT, G. Chemistry of lignin. *Chimie et industrie* 19:3-23, 407-416 (1928); *Pulp Paper Mag. Can.* 26: 1183-1188, 1235-1237, 1254-1258, 1267-1268, 1297-1300, 1326 (1928).

FUCHS, WALTER. Die Chemie des Lignins. Berlin, Springer, 1926. 327 p. Bibl. footnotes.

HAWLEY, L. F., and WISE, LOUIS E. Lignin. *In their Chemistry of wood*, 1926, p. 43-96. Bibl. footnotes.

HEUSER, EMIL. Survey of chemistry of lignin. *Paper Trade J.* 88, no. 21: 75-78 (1929). 55 footnotes.

KELLIN, C. Ligninforskningens nuvarande Standpunkt. *Svensk Kem. Tid.* 35: 209-218 (1925). 190 references.

KÜRSCHNER, KARL. Zur Chemie der Ligninkörper. Sammlung chem. chem.-tech. Vorträge 28: 71-186 (1926). Bibl. footnotes. *In part in Paper Trade J.* 86, no. 16: 62-71 (Apr. 19, 1928); *Tech. Assoc. Papers* 11: 100-109 (June, 1928).

SCHORGER, A. W. Lignin. *In his Chemistry of cellulose and wood*, 1926, p. 70-121. Bibl. footnotes.

See also PAPER.

LIGNITE

ELSMANN, KARL. Ueber die chemischen Verschiedenheiten der geologisch gleichartigen Kohlen des Hirschfelder und Osseger Lagers von der Bergakademie zu Freiberg. Halle, 1926. 11 p. Bibl. footnotes.

ERDMANN, ERNST I., and DOLCH, M. Die Chemie der Braunkohle. 2. Aufl. Halle, Knapp, 1927. 2 v. in 1. Bibl., pt. 2: 301-310.

FRITZSCHE, ARTHUR. Untersuchungen über die Brikettierung von Braunkohlen unter besonderer Berücksichtigung der Wasserbeständigkeit von Braunkohlenbriketts. Diss., Bergakademie zu Freiberg, 1928. 70 p. Bibl. footnotes.

FÜRTH, ARTHUR. Braunkohle und ihre chemische Verwertung. Dresden, Steinkopff, 1926. 135 p. Bibl. footnotes.

GOTHAN, WALTER U. E. F. Studien über die Schwelkohle und des Pyroissets. Halle, Knapp, 1925. 42 p. Bibl., p. 42.

KAUNERT, PAUL. Zur Frage der qualitativen und quantitativen Verhältnisse der Huminsubstanzen in der Braunkohle. Inaug.-Diss., Freiberg, 1926. 65 p. Bibl. footnotes.

KRAUSEL, R. Neuere Untersuchungen über die Entstehung der Braunkohle. *Naturwissenschaften* 13: 125-126 (1925). 26 references.

LUDOVICI, ADOLF. Ruhrkohle und rheinische Braunkohle, 1914-1926. Inaug.-Diss., Tech. Hochschule, Berlin, 1927. 114 p. Bibl., p. 5-8.

PIETZSCH, KURT. Die Braunkohlen Deutschlands. Berlin, Borntraeger, 1925. 488 p. Bibl., p. 461-470.

See also COAL: CARBONIZATION; FUELS.

LIME AND LIMESTONE

BERGER, ERNEST E. The function of steam in the limekiln. U. S. Bur. Mines, Tech. Paper 415. 1927. 43 p. Bibl., p. 42-43.

BLOCK, BERTHOLD. Das Kalkbrennen mit besonderer Berücksichtigung des Schachtofens mit Mischfeuerung und die Gewinnung von kohlenensäurehaltigen Gasen. 2. Aufl. Leipzig, Spamer, 1924. 512 p. Bibl., p. 493-495.

COWPER, ALFRED D. Lime and lime mortars. London, H. M. Stationery Off., 1927. *Gt. Brit. Dept. of Sci. Ind. Res., Building Res. Board., Special Rept. no. 9.* 81 p. Bibl., p. 74-76.

KNIBBS, N. V. S. Lime and magnesia. London, Benn, 1924. 306 p. References at end of chapters.

STEIDTMANN, EDWARD. Limestones and marls of Wisconsin. With a chapter on the economic possibilities of manufacturing cement in Wisconsin, by W. O. Hotchkiss and E. F. Bean. Wisconsin, Geol. and Natural History Survey, Bull. no. 66. Economic ser. no. 22. 1924. 208 p. Bibl., p. 3-4.

WITHROW, JAMES R. A symposium on lime. Ohio State Univ. Studies, Eng. Series, Bull. no. 35. 1927. 182 p. Bibl., p. 72-73, 116-117.

LINEN*

KAHN, OTTO W. Die deutsche Leinenindustrie. Berlin, Reimer, 1925. 143 p. Bibl., p. 140-141.

See also FIBERS; FLAX.

LINOLEUM

FISCHER, HUGO. Geschichte, Eigenschaften und Fabrikation des Linoleums; eine technologische Studie für Technologen, Linoleum- und Maschinenfabrikanten, Ingenieure, Architekten, Aerzte, usw. 2nd ed. 1924. Bibl. footnotes.

FRITZ, FELIX. Das Linoleum und seine Fabrikation mit besonderer Berücksichtigung seiner Geschichte, Eigenschaften und Verwendung. Berlin, Weber, 1926. 374 p. References and patent citations.

SCHWARZ, —. Die Herstellung von Linoleum, Kunstleder, Wachstuch u. dergl. *Kunststoffe* 14: 161-164, 177-181 (1924); 15: 34-38 (1925). Patents through text.

LINSEED OIL

FRITZ, FELIX. Das spezifische Gewicht des Leinoels. *Farben-Ztg.* 34: 24-28 (1928). 52 footnotes.

ROGERS, WM., JR., and TAYLOR, HUGH S. Rate of oxidation of linseed oil. *J. Phys. Chem.* 30: 1334-1347 (1926). 31 footnotes.

See also FATS, OILS, WAXES; FLAX-SEED; PAINTS.

LIPASE

Lipase. *Index-Cat. S. G. O.*, 3rd ser., 7: 671-672 (1928).

See also ENZYMES.

LIPOIDS

ARTOM, CAMILLO, and MARZIANI, ROSARIO. Sur la teneur comparée en substances grasses et lipidiques du foie de lapins normaux et ovariectomisés. *Bull. soc. chim. biol.* 6: 725-727 (1924). 62 references.

GUERRANT, NOLLIE B. Some relations of the phospholipins in seeds to other constituents. *J. Agr. Research* 35: 1017-1019 (1927).

JARISCH, ADOLF. Beiträge zur Pharmakologie der Lipoide. II. Seife und Serum. *Arch. ges. Physiol.* 194: 337-351 (1922). *Bibl.*, p. 351. 48 references.

Lipoids. *Index-Cat. S. G. O.*, 3rd ser., 7: 673-676 (1928).

MACLEAN, HUGH, and MACLEAN, I. S. Lecithin and allied substances, the lipins. New ed. London, Longmans, 1927. 220 p. *Bibl.*, p. 189-216.

ROSENBLOOM, JACOB. A bibliography of lipins (lipoids). Pittsburgh, 1916. 64 p.

SPERRY, WARREN M. Lipid excretion. IV. A study of the relationship of the bile to the fecal lipids with special reference to certain problems of sterol metabolism. *J. Biol. Chem.* 71: 376-378 (1927). 58 references.

TERROINE, EMILE F., and BELIN, PIERRE. L'élément constant des lipoides: ses caractères. *Bull. soc. chim. biol.* 9: 47-48 (1927). 20 references.

See also CHOLESTEROL; LECITHIN.

LIQUID CRYSTALS

FOOTE, H. W. Liquid crystals. *International critical tables I*: 320 (1926). 47 references.

LEHMANN, O. Aggregatzustände und flüssige Kristalle. *Z. physik. chem.* 102: 91-101 (1922). *Bibl.* footnotes.

LEHMANN, O. Flüssige Kristalle und ihr scheinbares Leben. *Forschungsergebnisse dargestellt in einem Kinofilm.* Leipzig, Verlag von L. Voss, 1921. 72 p. *Bibl.* footnotes.

VORLÄNDER, DANIEL. Chemische Kristallographie der Flüssigkeiten; kurze

Anleitung zur Synthese und Untersuchung polymorpher und kristallin-flüssiger Substanzen. 1924. *Bibl.* footnotes.

VORLÄNDER, DANIEL. Die Erforschung der molekularen Gestalt mit Hilfe der kristallinen Flüssigkeiten. *Z. physik. Chem.* 105: 211-254 (1923). *Bibl.* footnotes.

LITHIUM

Lithium. In *Gmelin's Handb. anorg. Chem.*, 8 aufl., System Number 20. 1927. 254 p. *Bibl.* through text.

LIVER

GREENE, CARL H., SNELL, ALBERT M., and WALTERS, WALTMAN. Diseases of the liver. I. A survey of tests for hepatic function. *Arch. Internal Med.* 36: 248-272 (1925). 97 footnotes.

Liver, chemistry of. *Index-Cat. S. G. O.*, 3rd ser., 7: 737-739 (1928).

Liver, extracts of. *Index-Cat. S. G. O.*, 3rd ser., 7: 722 (1928).

Liver, ferments of. *Index-Cat. S. G. O.*, 3rd ser., 7: 722-723 (1928).

Liver, functional tests of. *Index-Cat. S. G. O.*, 3rd ser., 7: 723-725 (1928).

Liver, glycogenic function of. *Index-Cat. S. G. O.*, 3rd ser., 7: 725-726 (1928).

Liver, metabolism of. *Index-Cat. S. G. O.*, 3rd ser., 7: 735 (1928).

Liver, physiology of. *Index-Cat. S. G. O.*, 3rd ser., 7: 737-739 (1928).

MANN, FRANK C. The effect of complete and partial removal of the liver. *Medicine* 6: 499-511 (1927). 231 references.

RETZLAFF, K. Ueber Prüfungsmethoden der Leberfunktion. *Klin. Wochschr.* 1: 850-851 (1922). 100 references.

WALLACE, GEORGE B., and DIAMOND, JOSEPH S. The significance of urobilinogen in the urine as a test for liver function. *Arch. Internal Med.* 35: 698-725 (1925). 43 footnotes.

WOHLGEMUTH, JULIUS. Chemie der Leber. In *Oppenheimer, Handb. Biochem.* 4: 595-602 (1924). 66 footnotes.

WOHLGEMUTH, JULIUS. Die Leber als sekretorisches Organ. In *Oppenheimer, Handb. Biochem.* 4: 603-630 (1924). 154 footnotes.

WOLTERSTORFF, GUSTAV. Fettgehalt der Leber gravidier Rinder. *Inaug.-Diss., Tierärztl. Hochschule, Hannover*, 1926. 32 p. *Bibl.*, p. 30-31.

LOBELIN *

Lobelin. *Index-Cat. S. G. O.*, 3rd ser., 7: 749 (1928).

LOW TEMPERATURE RESEARCH *

CROMMELIN, C. A. Die Bedeutung physikalischer Untersuchungen bei sehr tiefer Temperatur. *Jahrb. Radioakt. Elektronik* 19: 38-70 (1922). Bibl. footnotes.

HENNING, F. Erzeugung und Messung tiefer Temperaturen. *Ergeb. exakt. Naturwissenschaften* 2: 105 (1923). 25 references.

LUBRICATING OILS

ASCHER, RICHARD. Les lubrifiants: nature, examen et emploi: guide de l'industrie; traduit de l'allemand par G. Lehr. 1925. Bibl., p. 243-244.

CLARKE, R. W. L. Lubricants and lubrication and insulating oils. *J. Instn. Petroleum Tech.* 10: 612-618 (1925); 32 footnotes. 11: 337-342 (1926); 26 footnotes.

FALZ, ERICH. Grundzüge der Schmier-technik; Gestaltung und Berechnung vollkommen geschmierter Maschinenteile auf Grund der hydrodynamischen Theorie. Praktisches Handbuch für Konstrukteure, Betriebsleiter, Fabrikanten und Studierende des Maschinenbaufaches. Berlin, Springer, 1926. 291 p. Bibl., p. 282-284.

FLOWERS, ALAN E., MCBERTY, F. H., and REAMER, R. Deterioration and reclamation of used automobile crank case oil. *Ind. Eng. Chem.* 17: 484-485 (1925). 20 references.

GÜMBEL, LUDWIG. Reibung und Schmierung im Maschinenbau. Berlin, Krayn, 1925. 240 p. Bibl., p. 232-240.

KARPLUS, HANS. Der Aufbau der Schmierschicht und die Kolloidgraphischsmierung. *Petroleum Z.* 25: 275-286 (1929). 31 footnotes.

KLEMGARD, E. N. Lubricating greases. N. Y., Chem. Cat. Co., 1927. Bibl. of patents.

LOCKHART, LUTHER B. American lubricants from the standpoint of the consumer. 3rd ed. Easton, Pa., The Chem. Publ. Co., 1927. 408 p. Bibl. at end of chapters.

SINGER, L. Emulsified and saponified oils. *Petroleum* 1929, 25, bound-in supplement Motorenbetrieb und Maschinenschmierung, 2, no. 1 in no. 7 of Pet., p. 6-8; no. 2 in no. 9 of Pet., p. 4-5; no. 3 in no. 12 of Pet., p. 8-9. Bibl. and patent footnotes. 55 references.

VAN PATTEN, NATHAN. Selective bibliography of the literature of lubrication. Kingston, Can., Van Patten, 1926. 154 p.

WALTHER, C. Schmierstofftechnik. *Kolloid-Z.* 45: 374-378 (1928). 40 footnotes.

WOOG, PAUL. Contribution à l'étude du graissage; onctuosité, influences moléculaires. Paris, Delagrave, 1926. 277 p. Bibl., p. 261-263.

See also PETROLEUM.

LUMINAL

Luminal. Index-Cat. S. G. O., 3rd ser., 7: 786 (1928).

LUMINESCENCE

Luminescence. In Tables annuelles VI: 228-239 (1923-1926).

Luminescence. Index-Cat. S. G. O., 3rd ser., 7: 786-787 (1928).

MANGOLD, ERNST. Chemie der Lichtproduktion durch Organismen. In Oppenheimer, Handb. Biochem. 2: 433-441 (1925). 25 footnotes.

NICHOLS, E. L., and MERRITT, E. Low-temperature luminescence. International critical tables V: 390-391 (1929). 39 references.

PRINGSHEIM, PETER. Lichtelektrische Wirkung und Photolumineszenz. *Ergeb. exakt. Naturwissenschaften* 1: 359-361 (1922). 76 references.

SCHLEEDE, ARTHUR, and GANTZCKOW, HANS. Röntgenographische Untersuchung lumineszenzfähiger Systeme. *Z. physik. Chem.* 106: 37-48 (1923). 25 footnotes.

WÖHLER, LOTHAR. Ueber die Glimmerscheinung beim Erhitzen der Oxyde von Cr, Fe, Zr, Ti und Magnesiumpyrophosphat. *Kolloid-Z.* 38: 97-111 (1926). 54 footnotes.

See also FLUORESCENCE; PHOSPHORESCENCE.

LYMPH

Lymph. Index-Cat. S. G. O., 3rd ser., 7: 847 (1928).

MEYER-BISCH, ROBERT, and GÜNTHER, FRANZ. Physiologie und Pathologie der Lymphbildung. *Ergeb. Physiol.* 25: 575-578 (1926).

See also DIGESTION.

LYSOL

Lysol. Index-Cat. S. G. O., 3rd ser., 7: 867-868 (1928).

MAGNESIA CEMENTS

STEWART, LEROY C. Magnesia cements and concretes. International critical tables II: 129 (1927). 25 references.

MAGNESIUM

ANDERSON, ROBERT J. Metallurgy of magnesium and magnesium alloys. In Liddell, Non-ferrous metallurgy II: 778-780 (1926). 41 references.

BOYER, JOHN A. The corrosion of magnesium and of the magnesium aluminium alloys containing manganese. U. S. National Adv. Com. for Aeronautics, Rept. no. 248. 1926. 38 p. Bibl., p. 38.

GREGORY, J. C., and BURR, M. S. Magnesium and its compounds. In Friend, Textbook inorg. chem. III, pt. II: 34-91 (1926). Bibl. footnotes. Magnesium (and salts). Index-Cat. S. G. O., 3d ser., 7: 894-895 (1928). STOUGHTON, BRADLEY, and MIYAKE, M. A preliminary study of magnesium-base alloys. The Institute of Research, Lehigh Univ., Circ. no. 4. 1926. 17 p. Bibl. footnotes.

MAGNESIUM: Organic compounds.

COURTOT, CH. Le magnésium en chimie organique. Nancy, The author, 1926. 351 p. Extensive bibl. footnotes.

DUBIEN, M. Quelques progrès récents dans la chimie des organomagnésiums. Rev. gén. sci. 37: 366-371 (1926). 70 references.

HEPWORTH, HARRY. Some recent applications of magnesium in synthetic organic chemistry. J. Soc. Chem. Ind. 41: 7-11T (1922). Bibl. through text.

SECKLENK, W. Organometallverbindungen. In Houben-Weyl, Meth. org. Chem. 4: 720-978 (1924). Bibl. footnotes.

MAGNESIUM ARSENATES. See ARSENATES.

MAGNESIUM CARBONATE

HENTON, H. M. Magnesite. Mineral Ind. 35: 442-443 (1927); 36: 380-382 (1927). Includes magnesium and its alloys.

LADOO, R. B. Magnesite. In his Non-metallic minerals, p. 341-342. 30 references.

Magnesite and magnesite brick. J. Am. Ceramic Soc. 3: 237-246 (1920). Several pages of bibl.

WHITWELL, GEORGE E., and PATTY, ERNEST N. The magnesite deposits of Washington. Wash. Geol. Surv., Bull. 25. 1921. 194 p. Bibl., p. 175-189.

MAGNESIUM HYDROXIDE

LEHMAN, A. J. Pharmaceutical study of magmae magnesiae. J. Am. Pharm. Assoc. 18: 484-486 (1929). 102 references.

MAGNESIUM SILICATES

MELLOR, J. W. The complex silicates of magnesium. In his Inorg. theor. chem. 6: 417-419 (1925). About 375 references.

MELLOR, J. W. The higher silicates of magnesium. In his Inorg. theor. chem. 6: 405-407 (1925). About 150 references.

MELLOR, J. W. Hydrated magnesium silicates. In his Inorg. theor. chem. 6: 432-438 (1925). About 750 references.

MELLOR, J. W. Magnesium aluminium, thallium and rare earth silicates. In

his Inorg. theor. chem. 6: 826-835 (1925). About 1,200 references.

MELLOR, J. W. Magnesium metasilicates. In his Inorg. theor. chem. 6: 399-403 (1925). About 350 references.

MELLOR, J. W. Magnesium orthosilicates. In his Inorg. theor. chem. 6: 388-390 (1925). About 175 references.

MAGNESIUM SILICIDES. See SILICIDES.

MAGNESIUM SULFATE

Magnesium (sulphate of). Index-Cat. S. G. O., 3rd ser., 7: 895-896 (1928).

MALT

LECOQ, RAOUL. L'histoire du malt. Bull. soc. sci. hyg. aliment. 14: 56-83 (1926). Bibl. footnotes.

Malt, malt extracts, etc. Index-Cat. S. G. O., 3rd ser., 7: 944 (1928).

WEICHERTZ, JOSEF. Die Malzextrakte. Berlin, Springer, 1928. 388 p. Bibl., p. 374-377.

See also BREWING; FERMENTATION.

MANGANESE

BEHRE, C. H., JR. Manganese. Mineral Ind. 35: 459-460 (1927); 36: 395 (1927). 36 references.

CLEVINGER, G. H., and CARON, M. H. Treatment of manganese silver ores. U. S. Bur. Mines, Bull. 226. 1925. 110 p. Bibl., p. 102-105. 37 references.

LINDOW, C. W., and PETERSON, W. H. The manganese content of plant and animal materials. J. Biol. Chem. 75: 175 (1927). 30 references.

Manganese (and compounds of). Index-Cat. S. G. O., 3rd ser., 7: 953 (1928).

MANGANESE ARSENATES. See ARSENATES.

MANGANESE SILICATES

MELLOR, J. W. The manganese silicates. In his Inorg. theor. chem. 6: 901-904 (1925). About 400 references.

MANGANESE SILICIDES. See SILICIDES.

MARCHPANE

FINCKE, H. Geschichtliches von Marzipan und seinen Ersatzwaren. Z. Unters. Lebensm. 56: 335 (1928). 43 footnotes.

MARGARINE

LEBBIN, GEORG. Margarine, Herstellung, Eigenschaften, Verkehr mit Fabrikplananlagen und Abbildungen. Leipzig, Jänecke, 1926. 125 p. Bibl., p. vii-viii.

See also BUTTER; DAIRY PRODUCTS.

MARROW*

SABIN, FLORENCE R. Bone marrow. Physiol. Rev. 8: 239-244 (1928). 188 references.

MATCHES

MELLOR, J. W. Matches. *In his* Inorg. theor. chem. 8: 1060-1061 (1928). About 125 references.

MATÉ

Maté. Index-Cat. S. G. O., 3rd ser., 7: 1005 (1928). 15 references.

MATERIALS: Testing.

DEMUTH, W. Materialprüfung der isolier Stoffe der Electrotechnik. 2nd ed. Berlin, Springer, 1923. 254 p. Bibl., p. 248-250.

WAWRZINIOK, O. H. Handbuch des Materialprüfungswesen für Maschinen- und Bauingenieure. 2. Aufl. Berlin, Springer, 1923. 573 p. Bibl. footnotes.

See also X-RAYS.

MEAT PRODUCTS

CLEMEN, RUDOLPH A. American livestock and meat industry. N. Y., Ronald, 1923. 872 p. Bibl., p. 811-841.

INSTITUTE OF AMERICAN MEAT PACKERS. The use of meat; digests of scientific literature and original articles on the nutritive value of meat and its place in the diet. Ed. by C. R. Moulton. 1924. (Bull. no. 2). Bibl. footnotes.

KARS, HENDRIK J. De waarde van het bacteriologisch onderzoek van verschillende organen bij de keuring van slachtdieren. Sittard, N. V. v/h Alberts' drukkerijen, 1926. 155 p. Bibl., p. 151-155.

Meat. Index-Cat. S. G. O., 3rd ser., 7: 1037-1043 (1928).

RENNES, JACQUES. Inspection des viandes de boucherie, des volailles et gibiers, des poissons, crustacés et mollusques. 2 éd. Paris, E. le Francois, 1921. 358 p. Bibl., p. 347-352.

TOMHAVE, WILLIAM H. Meats and meat products. Philadelphia, Lippincott, 1925. 418 p. Bibl., p. 394-397.

WEAVER, R. H. Tests for incipient putrefaction of meat. Mich. Agr. Expt. Sta., Tech. Bull. 79. 1927. 28 p. 41 references.

See also FOODS.

MECONIUM

Meconium. Index-Cat. S. G. O., 3rd ser., 7: 1044-1045 (1928). 23 references.

See also ALKALOIDS.

MEERSCHAUM. *See* MAGNESIUM SILICATES.**MELANIN**

DEJUST, L. H. Pigment mélanique et ferments de la peau humaine. Bull. soc. chim. biol. 9: 1230-1232 (1927). 69 references.

Melanin. Index-Cat. S. G. O., 3rd ser., 7: 1119-1120 (1928).

SCHMALFUSS, HANS. Zum Chemismus der Melaninbildung. Naturwissenschaften 15: 456-457 (1927). 11 references.

See also PIGMENTS: ANIMAL.

MELTING POINTS

BRIDGMAN, P. W. Effect of pressure upon melting and transition points. Volume change on melting and transition. International critical tables IV: 16 (1928). 37 references.

FOOTE, H. W. Triple points, transition points and melting points at ordinary and low pressures. International critical tables IV: 6, 8-9 (1928). 160 references.

KEMPF, RICHARD. Bestimmung des Schmelzpunktes. *In* Houben-Weyl, Meth. org. Chem., 3rd ed., I: 773-825 (1925). Bibl. footnotes.

Points de fusion. *In* Tables annuelles V: 104-218 (1917-1922); VI: 112-147 (1923-1926).

MEMBRANES

COLLANDER, RUNAR. Ueber die Durchlässigkeit der Kupferferrozyanidniederschlagsmembrane für Nichtelektrolyte. Kolloidchem. Beihefte 19: 104-105 (1924). 38 references.

Membranes. Index-Cat. S. G. O., 3rd ser., 7: 1127 (1928).

Membranes, semipermeable. Index-Cat. S. G. O., 3rd ser., 7: 1128-1129 (1928).

PIERCE, H. F. Nitrocellulose membranes of graded permeability. J. Biol. Chem. 75: 814-815 (1927). 20 references.

MERCURY

DUSCHAK, L. H., and SCHUETTE, C. N. Metallurgy of quicksilver. Bur. Mines, Bull. no. 222 (1925). 173 p. Bibl., p. 165-167.

FEICK, RUDOLF. Polychrome Quecksilberhydrosol. Kolloid-Z. 37: 257-267 (1926). 57 footnotes.

GREGORY, J. C., and BURR, M. S. Mercury and its compounds. *In* Friend Textbook inorg. chem. III, pt. II: 201-311 (1926). Bibl. footnotes.

Mercury and compounds. Index-Cat. S. G. O., 3rd ser., 7: 1194-1200 (1928).

MERCURY: Ores.

LAUSEN, CARL, and GARDNER, E. D. Quicksilver (mercury) resources of Arizona. Arizona, Bur. Mines, Bull. no. 122; Mineral Tech. Ser. no. 29. 1927. 112 p. Bibl. references.

MERCURY ARSENATES. *See* ARSENATES.

MERCURY SILICATES. See SILICATES.

MERCURY SULFIDES

HENGLEIN, M. Quecksilbersulfide. In Doelter, Handb. Mineralchem. 4, pt. 1: 349-373 (1926). Bibl. footnotes.

METABOLISM

ARON, HANS. Biochemie des Wachstums des Menschen und der höheren Tiere. In Oppenheimer, Handb. Biochem. 2nd ed., 7: 152-234 (1926). 393 footnotes.

AUBEL, E. Sur le métabolisme microbien de l'acide pyruvique. Bull. soc. chim. biol. 6: 297-298 (1924). 31 references.

BELIN, PIERRE. Influence de l'alimentation sur la constitution des graisses de réserve (élément variable). Bull. soc. chim. biol. 8: 1148-1150 (1926). 38 references.

BLANCHETIÈRE, M. Le métabolisme basal. J. pharm. chim. 29: 185-192, 239-246 (1924). Biol. footnotes.

CASPARI, W., and STILLING, E. Der Eiweissstoffwechsel. In Oppenheimer, Handb. Biochem., 2nd ed., 9: 636-818 (1925). 891 footnotes.

CATHCART, E. P. The influence of muscle work on protein metabolism. Physiol. Rev. 5: 242-243 (1925). 77 references.

CATHCART, E. P., and BURNETT, W. A. Influence of muscle work on metabolism in varying conditions of diet. Proc. Roy. Soc. 99B: 425-426 (1926). 33 references.

CLARK, GUY W. Studies in the mineral metabolism of adult man. Univ. of Calif. Publ. Physiol. 5: 223-224 (1926). 33 references.

CRONHEIM, WALTER, and PAECHTNER, J. Gesamtstoffwechsel der Tiere. Kaltblütige Wirbeltiere. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 291-340 (1927). 128 references.

DEIGHTON, T. Study of the metabolism of two breeds of pigs. J. Agr. Science 19: 182-184 (1929).

DU BOIS, EUGENE F. Basal metabolism in health and disease. 2nd ed. Philadelphia, Lea & Febiger, 1927. 431 p. Bibl. footnotes.

EPSTEIN, NATHAN I. Studies in phosphate metabolism. Thesis, Columbia Univ., 1928. 23 p. Bibl., p. 22-23.

FÜRTH, OTTO. Kreatin, Kreatinin. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 627-635 (1928). 66 footnotes.

GAEHTEGENS, W. Methoden der bakteriologischen Untersuchung von Nahrungsmitteln. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 8: 1303-1808 (1925). Bibl. footnotes.

GAUTIER, CLAUDE, and WOLFF, RENÉ. Le métabolisme basal; ses applications en clinique. Paris, Doin, 1928. 172 p. Bibl., p. 147-167.

GOTTSCHALK, ALFRED. Allgemeiner Zellstoffwechsel. Grundlegung des "intermediären" Stoffwechsels. Speicherung, Entgiftung. In Oppenheimer, Handb. Biochem. 2: 595-621 (1925). 75 footnotes.

GOTTSCHALK, ALFRED. Umsatz der Kohlenhydrate. Der Kohlenhydratumsatz in tierischen Zellen. In Oppenheimer, Handb. Biochem. 2: 485-521 (1925). 183 footnotes.

GRAFE, E. Die spezifisch-dynamische Wirkung der Nahrungszufuhr. In Oppenheimer, Handb. Biochem., 2nd ed., 6: 610-641 (1926). 123 footnotes.

GRAFE, E. Die nervöse Regulation des Stoffwechsels. In Oppenheimer, Handb. Biochem., 2nd ed., 9: 1-97 (1925). 367 footnotes.

Infants, nutrition of. Index-Cat. S. G. O., 3rd ser., 6: 1017-1027 (1926).

ISAAC, S. Der parenterale Eiweissstoffwechsel. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 819-852 (1925). 175 footnotes.

JANSEN, W. H. Quantitative Bestimmung des Phosphor- und Kalkstoffwechsels. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 9: 509-582 (1925). Bibl. footnotes.

KAHN, MAX, and GOODRIDGE, F. G. Sulfur metabolism; a review of the literature. Philadelphia and N. Y., Lea & Febiger, 1926. 831 p. Contains bibl.

KAUFMANN-COSLA, O., ZÖRKENDÖRFER, ROLF, and ZÖRKENDÖRFER, WALTER. Action des eaux minérales sur le métabolisme des sucres. Recherches expérimentales "in vivo." Bull. soc. chim. biol. 9: 201-202 (1927). 41 references.

KING, JOHN T. Basal metabolism. Determination of the metabolic rate in the practice of medicine. Baltimore, Williams & Wilkins, 1924. 118 p. 300 references.

LEHMANN, GÜNTHER. Energetik des Organismus. In Oppenheimer, Handb. Biochem., 2nd ed., 6: 564-608 (1925). 100 footnotes.

LIPSCHITZ, WERNER. Ueber energieliefernde Zellprozesse. In Oppenheimer, Handb. Biochem. 2: 622-700 (1925). 468 references.

MACLEOD, JOHN J. R. Carbohydrate metabolism and insulin. N. Y., Longmans, 1926. 357 p. Bibl. at end of chapters.

METABOLISM—*Cont'd*

- MACLEOD, JOHN J. R. The fuel of life; experimental studies in normal and diabetic animals. Princeton, Princeton Univ. Press, 1928. 147 p. Bibl., p. 139-144.
- MANTEUFEL, P. Serologische Verfahren der Nahrungsmitteluntersuchungen. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 8: 1916-1918 (1926). 122 references.
- MATISSE, G. Action de la chaleur et du froid sur des etres vivants. 1919. Bibl., p. 539-551.
- MELLOR, J. W. Metabolism of animals and plants. In *his* Inorg. theor. chem. 6: 13-14 (1925). About 125 references, with special reference to CO₂.
- Metabolism. Index-Cat. S. G. O., 3rd ser., 7: 1210-1236 (1928).
- MÜLLER, FRANZ, and BIEHLER, WILHELM. Stoffwechsel und Klima. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 38-62 (1925). 131 footnotes.
- NEUBAUER, OTTO. Methoden zur Untersuchungen des intermediären Stoffwechsels. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 9: 583-718 (1925). Bibl. footnotes.
- NEUBERG, CARL. Umsatz der Kohlenhydrate. Von Zuckerumsatz der pflanzlichen Zelle. In Oppenheimer, Handb. Biochem. 2: 442-484 (1925). 217 footnotes.
- PINCUSSEN, LUDWIG. Die Ausnutzung der Nährstoffe. In Oppenheimer, Handb. Biochem. 5: 295-344 (1924). 157 footnotes.
- PINCUSSEN, LUDWIG. Die Beeinflussung des Stoffwechsel durch Strahlung. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 235-257 (1926). 137 footnotes.
- PINCUSSEN, LUDWIG. Umsatz der Zellstoffe ausser Kohlenhydrate. In Oppenheimer, Handb. Biochem. 2: 522-559 (1925). 154 footnotes.
- POTTER, PHILIP S. Metabolism of carbohydrates in infancy. Arch. Pediatrics 45: 515-525 (1928).
- POTTER, PHILIP S. Metabolism of fats in infancy. Arch. Pediatrics 45: 483-490 (1928).
- POTTER, PHILIP S. Mineral salt and water metabolism in infancy. Arch. Pediatrics 45: 633-652 (1928). 33 references.
- POTTER, PHILIP S. Protein metabolism in infancy. Arch. Pediatrics 45: 580-591 (1928). 49 references.
- ROSEMANN, R. Alkohol. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 482-533 (1925). 136 footnotes.
- ROWE, ALLAN W., and CHANDLER, JOSEPH. Metabolism of galactose. Endocrinology 8: 831 (1924). 34 references.
- SCHENCK, PAUL. Untersuchungen über die Grundlagen des Stoffwechsel des Herzens. Arch. ges. Physiol. 202: 315-355 (1924). Bibl. footnotes.
- SCHITTENHELM, ALFRED, and HARPUEDER, KARL. Der Nucleinstoffwechsel. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 580-626 (1925). 260 footnotes.
- SCHMIDT, THEODOR. Untersuchungen über den Kalkbedarf des Tierkörpers und den Kalkgehalt der Nahrung unserer Haustiere. Inaug. Diss., Giessen, 1923. 43 p. Bibl., p. 3.
- SCHULZ, FR. N. Gesamtstoffwechsel der Tiere. Hunde und Carnivoren. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 258-269 (1926). 66 footnotes.
- SCHULZ, FR. N. Gesamtstoffwechsel der wirbellosen Tiere. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 341-488 (1927). 605 footnotes.
- SCHULZ, FR. N. Stoffwechsel der Cholesterine und Inosite. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 545-579 (1925). 282 footnotes.
- SCHULZ, FR. N. Stoffwechsel der Phosphatide. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 534-544 (1925). 85 footnotes.
- SCHULZ, FR. N. Stoffwechsel der Vögel. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 270-290 (1926). 69 footnotes.
- SEARLE, CLAUDE H., and KOBER, PHILIP A. The mineral balance of the human body. Chicago, The Research Labs. of G. D. Searle & Co., 1926. 48 p. Bibl., p. 35-48.
- SJOLLEMA, B. (Mineral metabolism and the effect of various dietary factors.) Z. Tierzücht. Zuchtungsbiol. Tierernähr. 5: 1-74 (1925). Review with excellent classified bibl.
- SMITH, MILLARD. The minimum endogenous nitrogen metabolism. J. Biol. Chem. 68: 30-31 (1926). 34 references.
- TALBOT, FRITZ B. Basal metabolism of children. Physiol. Rev. 5: 508-517 (1925). 169 references.
- TIGERSTEDT, ROBERT, and TIGERSTEDT, CARL. Der Energiewechsel. In Oppenheimer, Handb. Biochem., 2nd ed., 6: 458-563 (1925). 166 footnotes.
- ZIEGLER, M. R., and MENDEL, L. B. Transportation and elimination of organic substances by the animal organism. New Haven, Yale Univ. Library, 1927. Bibl., p. 316-317.
- ZUNTZ, N., and LOEWY, A. Betrachtungen über die Beziehungen zwischen Nährstoffen und Leistungen des

Körpers (Die Quellen der Muskelkraft). *In* Oppenheimer, Handb. Biochem., 2nd ed., 6: 411-457 (1925). 104 references.

See also NUTRITION; PROTEINS.

METABOLISM: Abnormal.

BERGMANN, G. V., and STROEBE, F. Gesamtstoffwechsel unter pathologischen Bedingungen. Die Fettsucht. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 562-598 (1927). 83 footnotes.

BRUGSCH, THEODOR. Der Stoffwechsel bei Hunger und Unterernährung. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 1-37 (1925). 145 references.

Fever, metabolism in. Index-Cat. S. G. O., 3rd ser., 5: 719-720 (1925).

GIBSON, R. B., and HOWARD, C. P. Metabolic studies in pernicious anemia. Arch. Internal Med. 32: 1-16 (1923). 49 footnotes.

GOTTSCHALK, ALFRED. Anomalien des Eiweissabbaues. *In* Oppenheimer, Handb. Biochem., 2nd ed., 8: 853-891 (1925). 268 footnotes.

GREENWALD, ISIDOR. The effect of the administration of calcium salts and of sodium phosphate upon the calcium and phosphorus metabolism on thyro-parathyroidectomized dogs, with a consideration of the nature of the calcium compounds of blood and their relation to the pathogenesis of tetany. J. Biol. Chem. 67: 27-28 (1926). 64 references.

HARDING, VICTOR J. Metabolism in pregnancy. Physiol. Rev. 5: 299-302 (1925). 149 references.

KAPFFHAMMER, J. Die Leber im Stoffwechsel. *In* Oppenheimer, Handb. Biochem., 2nd ed., 9: 98-153 (1925). 363 footnotes.

Kidney, inflammation of, metabolism in. Index-Cat. S. G. O., 3rd ser., 7: 203 (1928).

LABBÉ, MARCEL. Métabolisme de l'eau: oedèmes—diurèse—les thérapeutiques hydriques. Paris, Masson, 1927. 256 p. Bibl., p. 241-252.

PINCUSSEN, LUDWIG. Stoffwechsel im Greisenalter, die Kachexien und Blutkrankheiten. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 489-525 (1927). 237 footnotes.

RAAB, W. Wärmeregulation und Fettstoffwechsel. Z. ges. exptl. Med. 53: 331 (1927). 59 references.

RICHTER, P. F. Gesamtstoffwechsel unter pathologischen Bedingungen. Fieber. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 526-561 (1927). 170 footnotes.

STROUSE, SOLOMON, *et al.* Studies on the metabolism of obesity. Arch. In-

ternal Med. 34: 267-274, 275-281 (1924). 34 footnotes.

WESSELKINA, W. M. Ueber den Stoffwechsel nach Leberexstirpation. Z. ges. exptl. Med. 55: 213 (1927). 41 references.

ZUNTZ, LEO. Stoffwechsel und Sexualität des Weibes. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 63-131 (1925). 439 footnotes.

ZUNTZ, LEO. Stoffaustausch zwischen Mutter und Frucht. *In* Oppenheimer, Handb. Biochem., 2nd ed., 7: 132-151 (1926). 104 footnotes.

See also DIABETES.

METAL SPRAYING*

TURNER, THOMAS H., and BUDGEN, W. F. Metal spraying. The origin, development, and applications of the metal-spray process of metallisation. London, Griffin, 1926. 175 p. Bibl., p. 164-168.

METALLOGRAPHY

CAMPBELL, WM. Twenty-five years of metallography. Trans. Am. Inst. Mining Met. Eng. 73: 1175-1178 (1926). 84 references.

CZOCHRAJSKI, JOH. Moderne Metallkunde in Theorie und Praxis. 1924. Bibl. footnotes.

GOERENS, PAUL. Einführung in die Metallographie. 5 ed. 1926. Bibl., p. 364-372.

HEYN, EMIL. Physical metallography. N. Y., Wiley, 1925. 440 p. Bibl. index, p. xiii-xxx; bibl. at end of each chapter.

PULSIFER, H. B. Structural metallography. Easton, Pa., Chemical Publ. Co., 1924. 210 p. Bibl. p. 5-9. 60 references.

METALLURGY

BELAIEV, N. T. Crystallization of metals. Univ. London Press, 1923. References at end of chapters.

Bibliography of season cracking. British Non-Ferrous Metals Research Assoc. Bull. No. 6: 14-18 (July, 1922). 47 references.

Bureau of Mines publications on ferrous metallurgy and related subjects. *In* Carnegie Inst. of Tech., *et al.*, Mining and Metallurgical Investigations, Bull. 27: 25-32 (1926). Covers 1910-1925.

CAMMEN, LEON. Principles of metallurgy of ferrous metals; a manual for mechanical engineers. 3rd ed. N. Y., Am. Soc. Mech. Eng., 1928. 202 p. Bibl. at end of each chapter.

COOK, MAURICE, and EVANS, ULICK R. Recrystallization and grain growth in soft metals. Trans. Am. Inst. Min.

METALLURGY—Cont'd

Met. Eng. 71:627-650 (1925). 51 references.

COTEL, ERNST. Der Siemens-Martin-Ofen; die Grundsätze des Herdstahl-ofen-Betriebes. Leipzig, Spamer, 1927. 150 p. Bibl., p. 135-147.

CROASDALE, STUART. Chlorine metallurgical processes. In Liddell, Non-ferrous metallurgy II:1151-1188 (1926). Bibl. footnotes.

DEJEAN, PIERRE. Actualités métallurgiques. Paris, Dunod, 1925. 283 p. Bibl., p. 263-277.

DESCH, CECIL H. Growth of metallic crystals. Trans. Am. Inst. Min. Met. Eng. 75:546-547 (1927). 41 references.

DEUTSCHE GESELLSCHAFT FÜR METALLKUNDE. Werkstoffhandbuch: Nicht-eisenmetalle. Berlin, Beuth-Verlag G. m. b. H., 1927. Contains bibl.

FOOTE, PAUL D. The relation between metallurgy and atomic structure. Trans. Am. Inst. Mining Met. Eng. 73:655-666 (1926). 42 references.

HARTLEY, LAWRENCE A. Elementary foundry technology, with special reference to gray iron and steel. N. Y., McGraw-Hill, 1928. 423 p. Bibl., p. 406-408.

HOFMAN, HEINRICH O. Tratado de metalurgia general; estudio de los metales, aleaciones, combustibles y materias refractarias.—Tecnología metalúrgica, operaciones auxiliares y complementarias. Barcelona, Gili, 1925. 1033 p. Bibl. footnotes.

LIDDELL, DONALD M. Handbook of non-ferrous metallurgy prepared by a staff of specialists. N. Y., McGraw-Hill, 1926. 2 v. Contains bibl.

MASING, G., and POLANYI, M. Kaltreckung und Verfestigung. Ergeb. exakt. Naturwissenschaften 2:243-245 (1923). 79 references.

Métallurgie. In Tables annuelles V:1799-1900 (1917-1922); VI:1605-1672 (1923-1926).

PETERS, F. Elektrometallurgie und Galvanotechnik. Vienna, Hartleben, 1900. 4 v. List of patents, v. 4, p. 222-240.

PROST, EUG. Métallurgie des métaux autres que le fer. 2nd. ed. Paris, Béranger, 1924. 1249 p. Bibl., p. ii-iii, vii-viii. Bibl. footnotes.

VAN DE PUTTE, —. Les progrès en métallurgie des métaux autres que le fer en 1924. Rev. universelle mines (7) 6:37-50 (1925). 110 footnotes.

RIMBACH, RICHARD. Research in metallurgical literature. Blast Furnace and Steel Plant 14:396-399 (1926). List of books and periodicals.

RIMBACH, RICHARD. Review of rolling mill literature. Blast Furnace and Steel Plant 14:261-264 (1926). Covers year 1925.

ROSENHAIN, W., et al. Properties of metals and alloys. International critical tables. II:358-609 (1927). Bibl. through text.

SAUERWALD, F. Kolloidchemische Gesichtspunkte in der Metallurgie. In Liesegang, Kolloidchem. Tech., 675-698 (1927). Bibl. footnotes.

SCHIEBOLD, E. Die Verfestigungsfrage vom Standpunkt der Röntgenforschung. Z. Metallkunde 16:417, 462 (1924); Mitt. kgl. Materialprüfungsamt, Special No. II:96-99 (1926). 122 references.

SOCIETY OF CHEMICAL INDUSTRY. Non-ferrous metals. In Reports of the progress of applied chemistry 10:258-275 (1925); 70 footnotes. 11:269-280 (1926); 50 footnotes. 12:273-282 (1927); 4 footnotes. 13:291-311 (1928); 112 footnotes.

THOMPSON, FRANK C. A course of metallurgy for engineers. London, Witherby, 1925. 240 p. Bibl., p. 235-237.

WOOD, W. P., and McMULLAN, O. W. Selective case-carburizing. Chem. Met. Eng. 26:1080 (1922). 26 references.

See also ELECTROMETALLURGY; Names of metals.

METALS

BUCK, E. C. Plastic metal deformation, 1835-1917: a bibliography. Iron Age 100:1066-1069 (1917).

Density of the metallic elements. International critical tables II:457 (1927). 104 references.

Effect of temperature upon the properties of metals. Proc. Am. Soc. Testing Materials 24, II:128-141 (1924). 216 references. Also in Pioneering in Science, Chicago, Crane Co., 1925. p. 124-136.

FISCHER, JOSEPH. Die Zerstäubungerscheinungen bei Metallen. Fortschritte Chem., Phys., physik. Chem. 19:69-70 (1927). 43 references.

PENZER, N. M. Non-ferrous metals and other minerals. London, Benn, 1924. Bibl., p. 221-255.

REGELSBERGER, FRIEDRICH. Chemische Technologie der Leichtmetalle und ihrer Legierungen. Leipzig, Spamer, 1926. 385 p. Lists of the important patents, European and American, are included.

SACHS, GEORG. Grundbegriffe der mechanischen Technologie der Metalle. Leipzig, Akad. Verlags., 1925. 319 p. Bibl., p. 283-300.

VON SCHWARZ, MAXIMILIAN. Metallphysik. Leipzig, Barth, 1925. 181 p. Bibl. footnotes.

See also Names of metals.

METALS: Fatigue.

GILLET, H. W., and MACK, E. L. Notes on some endurance tests of metals. Proc. Am. Soc. Testing Materials 24, II: 544-546 (1924). 54 references.

GOUGH, HERBERT J. Fatigue of metals and alloys. International critical tables II: 595-608 (1927). 28 references.

GOUGH, HERBERT J. The fatigue of metals. London, Scott, Greenwood, 1924. 304 p. A bibliography of the publications dealing with the effect of repeated stresses and related actions upon the strengths of materials, p. 267-281. 183 references.

MOORE, HERBERT F. Manual of the endurance of metals under repeated stress; a summary of views and test data, with instructions for use, compiled for designing, inspecting and testing engineers. N. Y., Engineering Foundation, Pub. no. 13, 1927. References, p. 62-63.

MOORE, HERBERT F., and KOMMERS, J. B. The fatigue of metals, with chapters on the fatigue of wood and of concrete. N. Y., McGraw-Hill, 1927. 326 p. Bibl., p. 290-316.

METALS: Hardness.

Bibliography on scratch-hardness methods as applied to metals. Proc. Am. Soc. Testing Materials 26, pt. I: 578-580 (1926). 18 references.

DOEHMER, P. W. Die Brinell'sche Kugeldruckprobe. Berlin, Springer, 1925. 192 p. Bibl., p. 177-183.

See also HARDNESS.

METALS: Oligodynamic action.

LOHNER, L., and MARKOVITS, B. E. Zur Kenntniss der oligodynamischen Metall-Gift-Wirkung auf die lebendige Substanz. I. Paramacienversuche. Arch. ges. Physiol. 195: 429-431 (1922).

PLOTHO, O. v. Der Einfluss kolloidaler Metalllösungen auf niedere Organismen und seine Ursachen. Biochem. Z. 112: 1-32 (1921). 42 footnotes; bibl., p. 30-32.

SAXL, P. Die oligodynamische Wirkung von Metallen und Metallsalze. Vienna, Springer, 1924. Extensive bibl.

METAPHOSPHORIC ACID

MELLOR, J. W. Metaphosphoric acid. In his Inorg. theor. chem. 8: 983-984 (1928).

METHANE

HENRI, VICTOR. Structure of the methane molecule. Chem. Reviews. 4: 201 (1927). 21 references.

METHANOL

Methyl alcohol. Index-Cat. S. G. O., 3rd ser., 7: 1242-1244 (1928).

SCHELLENBERG, A. Ueber die Zersetzung des Methyl Alkohol an Metallen und Metalloxyden. Ges. abh. Kenntnis Kohle 7: 9-12 (1925). Bibl. footnotes.

METHEMOGLOBIN *

Methaemoglobin. Index-Cat. S. G. O., 3rd ser., 7: 1241-1242 (1928).

METHOXY GROUP *

HERZIG, J. Ueber Methoxyl- und Methylimidbestimmung. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 3: 509-534 (1921). Bibl. footnotes.

METHYLENE BLUE

CLARK, W., MANSFIELD, COHEN, BARNETT, and GIBBS, H. D. Studies on oxidation-reduction. VIII. Methylene blue. Public Health Repts. 40: 1131-1201 (1925). Reprint no. 1017. 70 p. Bibl., p. 52-70. Classified.

Methylene blue. Index-Cat. S. G. O., 3rd ser., 7: 1244-1245 (1928).

METHYLPENTOSESES *

VOROČEK, ÉMILE. L'histoire des méthylpentoses et l'état actuel de leur chimie. Bull. soc. chim. 43: 26-29 (1928).

METRIC SYSTEM

JOHNSEN, JULIA E. Metric system. N. Y., H. W. Wilson Co., 1926. 111 p. Bibl., p. 21-38.

MICA

MELLOR, J. W. The micas. In his Inorg. theor. chem. 6: 628-640 (1925). About 1,500 references.

STODDARD, B. H. Mica in 1922. U. S. Geol. Surv., Min. Resources 1922, pt. 2: 162-164 (1923).

MICRO-ANALYSIS. See ANALYTICAL CHEMISTRY: MICRO METHODS.

MICROCHEMISTRY. See ANALYTICAL CHEMISTRY; BOTANICAL CHEMISTRY.

MICROCLINE. See FELDSPAR.

MICROSCOPY

GICKLHORN, JOSEPH. Mikrochemie und Mikrophysik. Protoplasma 2: 89-125 (1927). 100 references.

HADFIELD, R. Bibliography of the chief literature relating to micrography. Chronological. Trans. Faraday Soc. 16: 30-36. (1920).

MCCLUNG, CLARENCE E. Handbook of microscopical technique for workers in both animal and plant tissues. New York, Hoeber, 1929. 495 p. Bibl. footnotes.

MICROSCOPY—Cont'd

Microscope and microscopy. Index-Cat. S. G. O., 3rd ser., 7: 1265-1269 (1928).

NEILL, ROBERT M. Microscopy in the service of man. N. Y., Holt, 1926. 256 p. Bibl., p. 248-251.

SCALES, FRANCIS S. Practical microscopy; an introduction to microscopical methods. 3rd ed. London, Bailliere, Tindall and Cox, 1926. 332 p. Bibl., p. 314-321.

See also PHOTOMICROGRAPHY.

MILK

BATEMAN, GEORGE M., and SHARP, PAUL F. A study of the apparent viscosity of milk as influenced by some physical factors. J. Agr. Research 36: 672-674 (1928).

BLENKLE, VICTOR A. Protein milks in infant feeding. Archiv. Pediatrics 42: 760 (1925). 27 references.

DAHLBERG, A. C., and HENING, J. C. Viscosity, surface tension and whipping properties of milk and cream. N. Y. Agr. Expt. Sta., Tech. Bull. 113: 41-42 (1925).

EBERLEIN, L. Fortschritte auf dem Gebiete der Milchindustrien. Z. angew. Chem. 41: 1255-1257, 1279-1281 (1928). 25 bibl. footnotes.

FABER, HAROLD K. Acidified milks with special consideration of the indications and limitations to their use. Am. J. Diseases Children 31: 395-409 (1926). 46 footnotes.

Fundamentals of dairy science, by associates of Lore A. Rogers in the research laboratories of the Bureau of Dairy Industry, U. S. Dept of Agriculture. N. Y., Chem. Cat. Co., 1928. 543 p. Bibl. at end of each chapter.

GAINES, WALTER L. The energy basis of measuring milk yield in dairy cows. Univ. Ill., Agr. Expt. Sta., Bull. No. 308. 1928. 39 p. Bibl., p. 436-439.

GRIMMER, WALTHER. Lehrbuch der Chemie und Physiologie der Milch für Human- und Veterinärmediziner, Nahrungsmittelchemiker, Land- und Milchwirte sowie Studierende. 2. Aufl. Berlin, Parey, 1926. 326 p. Bibl. at end of chapters.

GRIMMER, WALTHER. Milch. In Junk, Tabulae Biologicae II: 536-567 (1925). Bibl. through text.

KNOCH, C. Handbuch der neuzeitlichen Milchverwertung. Berlin, Parey, 1927. 668 p. Patents, p. 620-651.

LEROUX, LUCIEN. Le lait et sa chimie. Rev. gén. sci. 36: 181 (1925). 48 references, covering 1921-1925.

LEVINE, VICTOR E. Acidified milks in infant feeding. Archiv. Pediatrics 43: 655-658 (1926). 85 references.

LEVINE, VICTOR E. Differences between cow's milk and woman's milk. Archiv. Pediatrics 43: 377-379 (1926). 98 references.

PALMER, L. S. The chemistry of milk and dairy products viewed from a colloidal standpoint. Ind. Eng. Chem. 16: 635 (1924). 33 references.

REICHART, E. L., and DAVIS, H. P. Commercial application of *Lactobacillus acidophilus* milk. Neb. Agr. Expt. Sta., Bull. 228: 17-19 (1928).

RIEVEL, HEINRICH. Handbuch der Milchkunde. 3. Aufl. Hannover, Schaper, 1926. 432 p. Bibl., p. 411-421.

SCHLOSSMANN, ARTHUR, and SINDLER, ADOLF. Milchdrüse und Milch. In Oppenheimer, Handb. Biochem. 4: 751-806 (1924). 476 footnotes.

WEEKS, VIRGINIA T. Survey of acid milk in infant feeding. Archiv. Pediatrics 42: 734 (1925). 29 references.

See also BUTTER; CHEESE; DAIRY PRODUCTS; FOODS.

MILK: Analysis and inspection.

AMERICAN PUBLIC HEALTH ASSOC. Laboratory Section. Standard methods of milk analysis, bacteriological and chemical. 5th ed. N. Y., The Association, 1927. 68 p. Bibl. at end of each chapter.

EBERLEIN, L. Neuere Milchuntersuchungsmethoden und ihre Bedeutung für die Milchwirtschaft. Z. angew. Chem. 42: 397-402 (1929). 21 footnotes.

HEINE, PAUL. Kompendium der Milchuntersuchung für Tierärzte. Hannover, Schaper, 1925. 102 p. Bibl., 2 p. after p. 102.

MONVOISIN, ALEXANDRE. Le lait et les produits dérivés. 3. éd. Paris, Vigot, 1925. Bibl. footnotes.

OVERMAN, OLIVER R. Relation of solids in milk to fat and specific gravity of the milk. Univ. of Illinois, Agr. Expt. Sta., Bull. no. 263. 1925. Bibl., p. 271.

RODILLON, GEORGES. L'analyse des laits. Paris, Bibliothèque pratique du pharmacien, 1924. 206 p. Bibl., p. 199.

MILK: Bacteriology.

CLARKE, JOHN J., and DOUGHERTY, JOSEPH M. A study of thermophilic bacteria in pasteurized milk. 56 p. Thesis, Catholic Univ. of America, 1926. 56 p. Bibl., p. 44-46.

See also BACTERIOLOGY.

MILK: Coagulation.

COSMOVICI, NICHOLAS L. L'action des ions H sur la coagulation du lait. Bull. soc. chim. biol. 7: 146-152 (1925).

ENGEL, ST., and HECKER, ELIZABETH. Milchgerinnung. In Oppenheimer, Handb. Biochem. 4: 714-750 (1924). 108 footnotes.

FRAZIER, WILLIAM C. Influence of some bacterial enzymes on the heat coagulation of milk. J. Dairy Sci. 8: 388-389 (1925). 31 references.

SOMMER, H. H., and HART, E. B. Heat coagulation of evaporated milk. Wis. Agr. Expt. Sta., Research Bull. 67: 45-47 (1926).

MILK: Composition

HAYS, W. P. Effect of environmental temperature on the percentage of fat in cow's milk. J. Dairy Sci. 9: 233-235 (1926). 33 references.

RICE, FRANK E., and MARKLEY, ALTON L. Relation of natural acidity in milk to composition and physical properties. J. Dairy Sci. 7: 483 (1924). 27 references.

TROY, H. C., and SHARP, PAUL F. Physical factors influencing the formation and fat content of gravity cream. J. Dairy Sci. 11: 224-226 (1928). 40 references.

MILK: Condensed.

HAARNAGEL, LUDWIG O. W. Ueber kondensierte Milch. Wirtschaftliches. Geschichtliches. Bakteriologisches. Inaug.-Diss., Tierärztl. Hochschule, Berlin, 1921. Bibl., 2d p. after p. 23.

HUNZIKER, OTTO F. Condensed milk and milk powder, prepared for factory, school and laboratory. 4th ed. La Grange, Ill., The author, 1926. 668 p. Bibl., p. 595-601.

JANDIN, ROBERT. Contribution à l'étude chimique et bactériologique des laits concentrés et de leurs altérations. Thèse, Univ. d'Alger., 1922. 83 p. Bibl., p. 79-83.

RICE, FRANK E. Use of unsweetened evaporated milk in infant feeding. Archiv. Pediatrics 44: 764-765 (1927). 22 references.

MILK: Dried.

PORCHER, CHARLES. Le lait desséché. 2nd éd. Lyon, Le Lait, 1926. 298 p. Bibl. footnotes.

MILK: Fermented.

ROGERS, LORE ALFRED. Fermented milks. Revised by W. R. Allbus. U. S., Dept. Agr., Dept. Bull. No. 319. 1928. 28 p. Bibl., p. 23-28.

MILK: Pasteurization and sterilization.

BRAND, HEINZ. Kritische und experimentelle Studien zur Pasteurisierung der Milch. (Kuhmilch und Frauenmilch). Promotionsarbeit, Eidg. tech. Hochschule, Zürich, 1925. 90 p. Bibl., p. 88-90.

LEVINE, VICTOR E. Pasteurized milk as food for the infant. Archiv. Pediatrics 44: 280-281 (1927). 28 references.

MILK SUPPLY

HAKEWESSELL, ANTON. Die Milchversorgung der Stadt Potsdam. Diss., Berlin, 1925 (?). 142 p. Bibl., p. 141-142.

Milk and milk supply. Index-Cat. S. G. O., 3rd ser., 7: 1278-1297 (1928).

OBERDORFER, KARL E. Die Milchversorgung von Württemberg unter besonderer Berücksichtigung der Tätigkeit der Molkereigenossenschaften. Inaug.-Diss., Leipzig, 1928. 100 p. Bibl., p. 96-99.

WALKER, HARVEY. Regulating the production, handling, and distribution of milk. Public Health Repts. 43: 2100-2108 (1928).

MINE GASES

MOSS, KENNETH N. Gases, dust and heat in mines. London, Griffin, 1927. Bibl. footnotes.

MINERAL RESOURCES

ARKANSAS. Bureau of Mines, Manufactures and Agriculture. Outlines of Arkansas' mineral resources, by George C. Branner, state geologist. Little Rock, publ. jointly by the Bur. Mines, Manufactures and Agriculture and State Geol. Surv., 1927. 352 p. Bibl. at end of chapters.

BRUHNS, W. Die nutzbaren Mineralien und Gebirgsarten im deutschen Reiche. 2nd ed. Berlin, Reimer, 1906. 859 p. Chronological bibl., p. 710-760.

CANADA. Dept. of Mines. Canada; geology, mines and metallurgical industries. By Wyatt Malcolm and A. H. A. Robinson. Second (triennial) Empire Mining and Metallurgical Congress, 1927. Ottawa, Govt. print. bur., 1927. 214 p. Bibl. references.

DINIZ GONSALVES, ALPHEU. Bibliographia da geologia, mineralogia e paleontologia do Brasil. 205 p. Brazil. Service Geologico, Mineralogia e Paleontologia. Boletim n. 27. 1928. 205 p.

FREYBERG, BRUNO V. Erz- und Mineral-lagerstätten des Thüringer Waldes. Berlin, Borntraeger, 1923. 198 p. Bibl. at beginning of each chapter.

JONES, WALTER B. Index to the mineral resources of Alabama. Geol. Surv. of Alabama, Bull. no. 28. 1926. 250 p. Bibl. references.

LADOO, RAYMOND B. Non-metallic minerals, occurrence, preparation and utilization. N. Y., McGraw-Hill, 1925. 686 p. Bibl. at end of chapters.

MINERAL RESOURCES—Cont'd

- LECOMTE-DENIS, MAURICE. Guide pratique de la prospection des mines et de leur mise en valeur. 4. éd., rev. Paris, Dunod, 1927. 710 p. Bibl., p. 687-692.
- MCCALLIE, SAMUEL W. A preliminary report on the mineral resources of Georgia. Rev. ed. Georgia, Geol. Surv., Bull. no. 23. 1926. 164 p. Bibl. references.
- MANSFIELD, GEORGE R. Geography, geology, and mineral resources of part of southeastern Idaho. U. S. Geol. Surv., Professional Paper 152. 1927. 453 p. Bibl., p. 403-409.
- MILLER, B. L., and SINGEWALD, J. T. Mineral deposits of South America. N. Y., McGraw-Hill, 1919. 1,038 references arranged by countries.
- Mineral resources of South Africa. In Official Yearbook of the Union, Pretoria, Govt. Print. and Stat. Off., 1924, p. 624-630. About 500 classified references.
- MORGAN, PERCY G. Minerals and mineral substances of New Zealand. New Zealand, Geol. Surv. Bull. no. 32 (n. s.). 1927. 119 p. Bibl., p. 2-5.
- NICKLES, JOHN M. Bibliography of North American geology. 1923-1924. U. S. Geol. Surv. Bull. 784. 1927. 280 p. 2,577 references. 1925-1926. Bull. 802. 1928. 286 p. 2,927 references.
- PAYNE, HENRY M. The undeveloped mineral resources of the South. Washington, D. C., Am. Mining Congress, 1928. 368 p. Bibl., p. 348-356.
- PENZER, N. M. Non-ferrous metals and other minerals. London, Benn, 1924. Bibl., p. 221-255.
- SCHUMACHER, FRIEDRICH. Uebersicht über die nutzbaren Bodenschätze Spaniens. Leipzig, Hirschfeld, 1926. 109 p. Bibl., p. 77-83.
- SCRIVENOR, JOHN B. The geology of Malayan ore-deposits. London, Macmillan, 1928. 216 p. Bibl., p. 200-206.
- SHEAD, A. C. Chemical analyses of Oklahoma mineral raw materials. Okla. Geol. Survey, Bull. no. 14. 1929. 138 p. Bibl. of 75 references, p. 14-20.
- SMITH, WARREN DUP. Geology and mineral resources of the Philippine Islands. Philippine Islands, Bur. Science, Publ. no. 19. 1924. 559 p. Bibl. of Philippine geology, paleontology, geography, mineralogy and related subjects (1574 to 1921) (Compiled by Hubert G. Schenck), p. 478-519.
- SPARN, E. Bibliografía de la geología, mineralogía y paleontología de la Republica Argentina 1922-1924. Academia Nacional de Ciencias, Cordoba, Argentina, 1925. 57 p.
- WALLACE, ROBERT C. The mineral resources of Manitoba. Winnipeg, 1927. 58 p. Bibl. of economic minerals in Manitoba, p. 47-53.
- WANG, C. Y. Bibliography of the mineral wealth of China. III. J. Assoc. Chinese Am. Eng. 6, no. 5: 37-53 (1925). Covers 1918-1924.
- WATSON, T. L. Mineral resources of Virginia. 1907. About 38 separate lists of references on minerals and mineral deposits of Virginia.
- WHITLOCK, H. P. List of New York mineral localities. In N. Y. State Museum, Bull. 70, p. 11 (1903). Bibl. of 231 references on minerals and mineral localities of N. Y.
- WIGAN, ENG. *Free Public Library*. Jubilee exhibition of early mining literature, May 1st to September 29th, 1928. Annotated catalogue, compiled and arranged with an introduction by Arthur J. Hawkes. Wigan, printed for the Libraries Committee, 1928. 38 p.
- See also ORES; PETROLEUM; ETC.

MINERALOGY

- ÅHLANDER, F. E. Catalog of Swedish geological, paleontological, petrographic and mineralogical literature for 1923. Geol. For. Forth. 46: 696-703 (1924). 129 references.
- BILLOWS, EDOARDO. Lessico mineralogico per la regione Veneta. Padova, Prem. Soc. coop. tipografica, 1919. 54 p. Bibl., p. 7-14.
- BLACK, G. F. List of works relating to the geology, mineralogy and palaeontology of New Jersey. N. Y. Public Library, 1916. Several hundred references.
- EITEL, WILHELM. Physikalisch-chemische Mineralogie und Petrologie; die Fortschritte in den letzten zehn Jahren. Dresden, Steinkopff, 1925. 174 p. Bibl. footnotes.
- VAN DER VEEN, RUDOLF W. Mineragraphy and ore-deposition. The Hague, Naef, 1925. Bibl. references.

MOISTURE: Determination.*

- BONGARDS, HERMANN. Feuchtigkeitsmessung. 1926. Bibl., p. 311-317.

MOLECULAR REARRANGEMENTS

- PORTER, CHARLES W. Molecular rearrangements. N. Y., Chem. Cat. Co., 1928. 167 p. Bibl. footnotes.

MOLECULAR THEORY*

- KENNER, JAMES. Some aspects of the problem of molecular structure. Australasian Assoc. Adv. Sci. 18: 152-155 (1926). 125 references.

MÜLLER, ROBERT. Der Aufbau der chemischen Verbindungen (Molekülbau). Sammlung chem. chem.-tech. Vorträge 30:142-150 (1928). 185 references.

MOLECULAR WEIGHTS

Poids moléculaires. In *Tables Annuelles* V: 852-867 (1917-1922); VI: 833-839 (1923-1926).

SIMONIS, H. Bestimmung des Molekulargewichts. In *Houben-Weyl, Meth. org. Chem.* 3rd ed., I: 898-935 (1925). Bibl. footnotes.

MOLYBDENUM

ALTERTHUM, H. Neuere über Molybdän und seiner Verwendung. *Z. angew. Chem.* 42:2-11 (1929). 59 references.

EARDLEY-WILMONT, V. L. Molybdenum; metallurgy and uses and the occurrence, mining and concentration of its ores. Canada, Dept. of Mines, Mines Br., no. 592. 1925. 292 p. Bibl., p. 271-280. About 250 references.

HOERMANN, F. Beitrag zur Kenntniss der Molybdate und Wolframate. *Z. anorg. allgem. Chem.* 177:145 (1928). 65 footnotes.

VALLANCE, R. H., and ELDRIDGE, A. A. Molybdenum. In *Friend, Textbook inorg. chem.* VII, pt. III:111-180 (1926). Bibl. footnotes.

See also TUNGSTEN.

MOLYBDENUM ARSENATES. See ARSENATES.

MOLYBDENUM SILICATES. See SILICATES.

MOLYBDENUM SILICIDES. See SILICIDES.

MOLYBDENUM SULFIDE *

SEEBACH, M. Molybdänglanz. In *Doelter, Handb. Mineralchem.* 4, pt. 1: 67-71 (1926). 40 footnotes.

MORDANTS. See DYES.

MORPHINE

BALLS, A. K., and WOLFF, WM. A. Determination of morphine. *J. Biol. Chem.* 80:401-402 (1928). 27 references.

Morphine (and compounds). *Index-Cat. S. G. O.*, 3rd ser., 7:1355-1357 (1928).

See also ALKALOIDS.

MORTAR

JOHNSON, HARRY V. Cement-lime mortars. U. S. Bur. Standards, Tech. Papers no. 308. 1926. Bibl., p. 269-274.

See also CEMENT; LIME AND LIMESTONE.

MOTHPROOFING *

MULLIN, C. E. Mothproofing compounds—Their composition and patents. *Textile Colorist* 48:89-91 (1926). Patents through text.

SACHS, ALBERT P. History of the prevention of moth damage. *Textile Colorist* 48:529-530 (1926). 35 patents.

MUCOPROTEINS. See HEXOSAMINES.

MUSCLE

COTONIO, MARGHERITA. The mechanism of lactic acid formation in muscle tissue. *J. Biol. Chem.* 73:358, 475 (1927).

EVANS, C. LOVATT. The physiology of plain muscle. *Physiol. Rev.* 6:392-398 (1926). 287 references.

HILL, A. V. Laws of muscular motion. *Proc. Roy. Soc. (London)* 100B:67-108 (1926). 25 references.

Muscle, chemistry of. *Index-Cat. S. G. O.*, 3rd ser., 7:1412-1415 (1928).
Muscle, effect of chemical agents on. *Index-Cat. S. G. O.*, 3rd ser., 7:1418-1420 (1928).

Muscle, metabolism of. *Index-Cat. S. G. O.*, 3rd ser., 7:1427 (1928).

NEEDHAM, DOROTHY M. Red and white muscle. *Physiol. Rev.* 6:25-27 (1926). 72 references.

RIESSER, OTTO. Ueber den Tonus der Muskeln. *Klin. Wochschr.* 4:55 (1925). 59 references.

MUSK

WAGNER, ALFRED. Künstlicher Moschus, seine Darstellung, Verwendung, Verfälschung und Prüfung. *Chem.-Ztg.* 51:625-628, 646-647 (1927). 36 footnotes.

MUSTARD GAS

Mustard gas. *Index-Cat. S. G. O.*, 3rd ser., 7:1453-1454 (1928).

See also CHEMICAL WARFARE.

MUTAROTATION *

KUHN, RICHARD, and JACOB, PAUL. Ueber Mutarotation. Ein Beitrag zur Theorie der chemischen Reaktionsgeschwindigkeit. *Z. physik. Chem.* 113:389-431 (1924). Bibl. footnotes.

NAPHTHALENE

VAN DER KAM, E. J. Tabellarische Uebersicht der Naphtalinderivate. I Teil — Tabellen; II Teil — Literatur. The Hague, Martinus Nijhoff, 1927. 453 p.

NARCOTICS

HANSEN, KLAUS. Zur Theorie der Narkose. Untersuchungen über die Verteilung der indifferenten Narkotika in dem tierischen Organismus. Oslo, Norli, 1925. 262 p. Bibl., p. 240-262.

NARCOTICS—Cont'd

RENNER, ALBRECHT. Schlafmitteltherapie. Berlin, Springer, 1925. 125 p. Bibl., p. 106-123.

See also ALKALOIDS; DRUGS; ETC.

NEOARSPHENAMINE. See ARSPHENAMINE.

NEON

Neon. In Gmelin's Handb. anorg. Chem., 8th ed., 1926: 99-126 (System-Nummer I).

See also RARE GASES.

NEPHELITE. See ALUMINUM SILICATES.

NEPHELOMETRY *

KLEINMANN, HANS. Beiträge zur Nephelometrie. Kolloid-Z. 36: 168-174 (1925). 20 references.

YOE, JOHN H. Nephelometry. In Alexander, Colloid chemistry II: 165-184 (1928). Bibl. footnotes; bibl., p. 183-184.

YOE, JOHN H. Photometric chemical analysis. II. Nephelometry. N. Y., Wiley, 1929. 316 p. Bibl., p. 287-311. Classified.

NEPHRITIS *

BROWN, GEORGE E., and ROTH, GRACE M. The anemia of chronic nephritis. Arch. Internal Med. 30: 817-840 (1922). 51 bibl. footnotes.

SCHWARZ, HERMAN, and KOHN, JEROME L. Studies of nephritis in children. I. Nephrosis. Am. J. Diseases Children 24: 124-159 (1922). 59 footnotes.

NERVES

BRINKMAN, R., and DAM, E. v. Die chemische Uebertragbarkeit der Nervenreizwirkung. Arch. ges. Physiol. 126: 66-82 (1922). Bibl. footnotes.

NICKEL

SCHORNSTEIN, WALDEMAR. Die Rolle kolloider Vorgänge bei der Erz- und Mineralbildung insbesondere auf den Lagerstätten der hydrosilikatischen Nickelerze. Halle, Knapp, 1927. 87 p. Bibl., p. 63-64.

NICKEL ARSENATES. See ARSENATES.

NICKEL ARSENIDES *

DOELTER, C. Das System Ni-As und die künstlichen Nickelarsenide. In his Handb. Mineralchem. 4, pt. 1: 702-739 (1926). Bibl. footnotes.

NICKEL SILICATES. See SILICATES.

NICKEL SILICIDES. See SILICIDES.

NICKEL SULFIDES *

DOELTER, C. Verbindungen von Nickel mit Schwefel. In his Handb. Mineralchem. 4, pt. 1: 695-702 (1926). Bibl. footnotes.

NITRATES

ESCALES, R. Die Explosivstoffe. vol. 1. Schwarzpulver und Sprengsalpeter. 2nd ed. Leipzig, Veit, 1914. 475 p. Bibl., p. 463-466. Patents, p. 467.

See also GUNPOWDER.

NITRATES: Analysis.

NIKOLAS, H., and GRANDEL, F. Ueber die Beziehungen zwischen Pflanzen- und Bodennitraten. Naturw. u. Landw., No. 12. 1927. 128 p. Bibl. of 60 references, p. 125-128.

NITRATION

BATTEGAY, M. La nitration à l'hypoazotide. Bull. soc. chim. 43: 109-134 (1928). Bibl. footnotes.

KÜRSCHNER, K., and SCHARRER, K. Ueber die Bestimmung der Nitration. Chem.-Ztg. 49: 1077-1078 (1925). 43 footnotes.

VAN DER LEE, J. Nitration of cinnamic acid derivatives. Rec. trav. chim. 45: 674-709 (1926). 72 footnotes.

MASCHMANN, ERNST. Nitriren. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2, 1st half: 515-642 (1927). Bibl. footnotes.

See also NITRO GROUP.

NITRIC ACID

JOSS, E. J. The action of metals on nitric acid. J. Phys. Chem. 30: 1222-1275 (1926). Bibl. footnotes.

MELLOR, J. W. Nitric acid. In his Inorg. theor. chem. 8: 557-558, 562, 567-568, 580-582, 596-598 (1928).

WAESER, B. Stickstoffindustrie. Dresden, Steinkopf, 1924. 128 p. Bibl. footnotes.

See also ACIDS, ALKALIS, SALTS; AMMONIA; CHEMICAL EQUILIBRIUM.

NITRIC OXIDE

MELLOR, J. W. Nitric oxide. In his Inorg. theor. chem. 8: 444-449 (1928).

NITRIDES *

MELLOR, J. W. The nitrides. In his Inorg. theor. chem. 8: 137-144 (1928).

See also NITROGEN: FIXATION.

NITRIFICATION

BATHAM, H. N. Nitrification in soils. Soil Science 20: 350-351 (1925). 26 references.

BUSWELL, A. M., and NEAVE, S. L. Résumé of the problem of nitrogen losses through nitrification. Soil Science 24: 288-290 (1927). 50 references.

GERRETSEN, FREDERICK C. Een onderzoek naar de nitrificatie en denitrificatie in tropische gronden. Proefschrift, Tech. Hoogeschool, Delft, 1921. 141 p. Bibl., p. 7-16.

- GIOBEL, G. Relation of the soil nitrogen to nodule development and fixation of nitrogen by certain legumes. *N. J. Agr. Expt. Sta., Bull.* 436:119-125 (1927).
- GREAVES, J. E., and NELSON, D. H. The influence of nitrogen in soil on azofication. *Utah Agr. Expt. Sta., Tech. Bull.* no. 185. 1923. 23 p. Bibl., p. 21-23. 35 references.
- NIKLEWSKI, BRONISLAW. Diminution du taux de l'azote dans le fumier sous l'influence des bactéries nitrifiantes. *Bull. soc. chim. biol.* 5:499-500 (1923). 27 references.
- SMITH, ARTHUR M. A study of the factors influencing the efficiency of different forms of nitrogen as related to soil type and cropping system in the Atlantic coastal plain region. *Soil Science* 23:160-164 (1927).
- WALKER, B. H. Physiological studies on the nitrogen fixing bacteria of the genus *Rhizobium*. *Iowa Agr. Expt. Sta., Research Bull.* 113:403-406 (1928).
- WHITNEY, A. L. Some important factors controlling the rate of nitrification of organic materials. *J. Am. Soc. Agronomy* 18:872-876 (1926).
- See also NITROGEN: FIXATION (Mellor).
- NITRO GROUP ***
- HOUBEN, J. Die Nitrogruppe. *In* Houben-Weyl, *Meth. org. Chem.* 4:101-232 (1924). Bibl. footnotes.
- NITROCELLULOSE**
- BRÉGUET, ANDRÉ. Les collodions de nitrocellulose. *Rev. gén. mat. plastiques* 2:215-225, 297-302, 429-435, 507-513, 563-567, 629-643, 679-685 (1926); 3:71-77 (1927). 128 references.
- ESCALES, R. Die Explosivstoffe. vol. 2. Schiessbaumwolle. (Nitrocellulosen). Leipzig, Veit, 1905. 308 p. Bibl., p. 295-296; patents, 297-298.
- GABILLION, R. Analyse des nitrocelluloses. *Rev. gén. mat. plastiques* 2:92 (1926). 25 references.
- GABILLION, R. La nitration de la cellulose. *Rev. gén. mat. plastiques* 2:495-506 (1926); 3:15-27, 67-69, 226-230, 279-281 (1927). 96 references.
- MUEHLENDahl, E. v. Dünnlösliche Nitrocellulosen. *Farben-Ztg.* 34:1063-1065 (1929). 57 footnotes.
- PAYRAS, G. La stabilisation des nitrocelluloses pour celluloïd. *Rev. gén. mat. plastiques* 1:65-69, 123-129, 182-185 (1925); 2:19-24, 149-163, 615-627 (1926). 100 references.
- See also EXPLOSIVES.
- NITROGEN**
- MELLOR, J. W. Nitrogen. *In his* *Inorg. theor. chem.* 8:46-47, 51-53, 68-75, 78-79, 82-83, 88-89, 94, 96-97 (1928).
- PRIDEAUX, EDMUND B. R., and LAMBOURNE, HERBERT. Nitrogen. *Friend, Textbook inorganic chemistry* vol. VI, pt. 1 (1928). 242 p. Bibl. footnotes.
- WAESER, BRUNO. Fortschritte der anorganischen Grossindustrie in den Jahren 1924-1926. *Stickstoff und seine Verbindungen. Fortschrittsber. Chem.-Ztg.* no. 2:33-52 (1927). 515 footnotes.
- WAESER, B. Stickstoffindustrie. Dresden, Steinkopf, 1924. 128 p. Bibl. footnotes.
- See also AIR; ATMOSPHERE; GASES: LIQUEFACTION.
- NITROGEN: Analytical.**
- CARLYLE, S. E., and FRAPA, G. S. Review of A. O. A. C. work on alkaline and neutral methods for nitrogen. *J. Assoc. Official Agr. Chem.* 10:190 (1927). 25 references.
- PHILLIPS, T. G. The determination of nitrogen in relatively simple compounds. *Plant Physiol.* 2:205-211 (1927). 13 references.
- SCHARRER, K. Zur Bestimmung des Gesamtstickstoffs im Kalkstickstoff. *Chem.-Ztg.* 49:237-238, 243-244 (1925). 27 footnotes.
- TOTTINGHAM, W. E. Determination of peptide and basic forms of nitrogen. *Plant Physiol.* 2:497-502 (1927). 24 references.
- NITROGEN: Fixation.**
- CANADA. *Honorary Advisory Council for Scientific and Industrial Research. Nitrogen Fixation Committee.* Nitrogen in industry. Honorary Adv. Council for Sci. and Ind. Res., *Bull.* no. 12, 1927. 55 p. Bibl., p. 54-55.
- ERNST, FRANK A. Fixation of atmospheric nitrogen. *N. Y., Van Nostrand*, 1928. 154 p. Bibl., p. 138-150.
- GUICHARD, MARCEL. Les industries de fixation de l'azote. Paris, Colin, 1925. 204 p. Bibl., p. 197-199.
- GUYE, P. A. La fixation industrielle de l'azote. *Bull. soc. chim.* (4) 5, Suppl., May, 1909. 68 p. Bibl. footnotes.
- JURISCH, K. W. Bericht über Luftsalpeter. *Z. Sauerst. Stickst.-Ind.* 1:218-221, 242-244 (1909). Chronological, from 1904-1909. Supplements Jurisch's Salpeter und sein Ersatz, 1908.
- MELLOR, J. W. The fixation of atmospheric nitrogen by direct oxidation. *In his* *Inorg. theor. chem.* 8:378-382 (1928).
- MELLOR, J. W. The fixation of atmospheric nitrogen by organisms. *In his* *Inorg. theor. chem.* 8:362-365 (1928).
- UNITED STATES. *Congress. House. Committee on Military Affairs.* Muscle Shoals. Hearings before the Com-

NITROGEN: Fixation—Cont'd

mittee on Military Affairs House of Representatives, Sixty-ninth Congress, Second Session, on H. R. 16396, H. R. 16614. Washington, U. S. Govt. print. off., 1927. Bibliography, nitrogen, pt. 3: 731-741. The Muscle Shoals project, a bibliographical list, with index. Comp. by Florence S. Hellman, chief assistant, Division of Bibliography, Library of Congress, pt. 4: 1373-1390.

WAESER, BRUNO. The atmospheric nitrogen industry, with special consideration of the production of ammonia and nitric acid. London, Churchill, 1926. 2 v. Bibl., v. 2: 698-716.

WAESER, B. Die Luftstickstoffindustrie. Leipzig, Spamer, 1922. 586 p. Bibl., p. 551-567. Bibl. footnotes.

WAESER, B. Stickstoffindustrie. Dresden, Steinkopff, 1924. 128 p. Bibl. footnotes.

See also AMMONIA; FERTILIZERS; NITRIC ACID; NITRIFICATION; NITROGEN; SODIUM CYANIDE.

NITROGEN: Halogen compounds.*

LYNN, E. V., and SHOEMAKER, H. A. Chemistry of nitrosyl chloride. J. Am. Pharm. Assoc. 15: 176-178 (1926). 76 references.

MELLOR, J. W. The halogen compounds of nitrogen. *In his* Inorg. theor. chem. 8: 611-612, 621-622, 624 (1928).

Nitrosylchloride. *In* Gmelin's Handb. anorg. Chem., 8 Aufl., System Nummer 6 (1927): 424-437.

NITROGEN: Organic compounds.

HOLLINS, C. Synthesis of nitrogen ring compounds. London, Benn, 1924. 423 p. Patents and bibl. footnotes.

NITROGEN OXIDES

MELLOR, J. W. Nitrogen oxides—nitrous oxide or hyponitrous oxide. *In his* Inorg. theor. chem. 8: 400-404 (1928).

MELLOR, J. W. Nitrogen pentoxide. *In his* Inorg. theor. chem. 8: 554-555 (1928). About 75 references.

MELLOR, J. W. Nitrogen peroxide or tetroxide. *In his* Inorg. theor. chem. 8: 548-550 (1928).

MELLOR, J. W. Nitrogen trioxide. *In his* Inorg. theor. chem. 8: 454 (1928). About 75 references.

PRIDEAUX, E. B. R., and LAMBOURNE, HERBERT. The oxides of nitrogen. *In* Friend, Textbook inorg. chem. VI, pt. I: 142-181 (1928). Bibl. footnotes.

NITROGEN SULFIDE

MELLOR, J. W. Nitrogen sulphides or sulphur nitrides. *In his* Inorg. theor.

chem. 8: 632 (1928). About 50 references.

NITROGLYCEROL

ESCALES, R. Die Explosivstoffe. vol. 3. Nitroglycerin und Dynamit. Leipzig, Veit, 1908. 336 p. Bibl., p. 321-322; patents, p. 323.

NAOÛM, PHOKION P. Nitroglycerin und Nitroglycerinsprengstoffe (Dynamit) mit besonderer Berücksichtigung der dem Nitroglycerin verwandten und homologen Salpetersäureester. 1924. Bibl. footnotes.

NAOÛM, PHOKION P. Nitroglycerin and nitroglycerin explosives. Baltimore, Williams and Wilkins, 1928. 469 p.

See also EXPLOSIVES; GLYCEROL.

NITROSO GROUP *

SCHMIDT, JUL. Nitrosogruppe. *In* Houben-Weyl, Meth. org. Chem. 4: 38-100 (1924). Bibl. footnotes.

NITROSYLSULFURIC ACID

MELLOR, J. W. Nitroxylsulphonic acid or nitrosylsulphuric acid. *In his* Inorg. theor. chem. 8: 702 (1928). About 50 references.

NITROUS ACID

MELLOR, J. W. Nitrous acid. *In his* Inorg. theor. chem. 8: 467-470, 524-529 (1928).

NUCLEIC ACIDS

FEULGEN, R. Chemie und Physiologie der Nucleinstoffe. Berlin, Borntraeger, 1923. 432 p. 928 footnotes.

SAMUELY, FRANZ, and STEUDEL, H. Nukleoproteide. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 1-14 (1922). Bibl. footnotes.

STEUDEL, H. Darstellung und Nachweis der Nukleinsäuren. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 15-44 (1922). Bibl. footnotes.

STEUDEL, H. Vollständiger Abbau der Nukleinsäure, Nachweis der Bausteine, deren Darstellung. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 45-62 (1922). Bibl. footnotes.

THANNHAUSER, —. Abbau der Nukleinsäuren. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 63-100 (1922). Bibl. footnotes.

NUTRITION

CANNON, HELEN C. Formules de différents types de régime et méthodes de préparation des aliments employés pour les expériences de nutrition sur le rat. Bull. soc. sci. hyg. aliment. 14: 363-365 (1926). 50 references.

DEJUST, HENRI. Lumière et nutrition. Bull. soc. sci. hyg. aliment. 13: 214-215 (1925). 32 references.

GRAY, H., and EDMANDS, G. H. Indices of the state of nutrition in children. *Am. J. Diseases Children* 23: 226-237 (1922). 42 footnotes.

JACKSON, CLARENCE M. The effects of inanition and malnutrition upon growth and structure. Philadelphia, Blakiston, 1925. Bibl., p. 479-586.

KENNEDY, WALTER P. Diet and sterility. *Physiol. Rev.* 6: 498-503 (1926). 100 references.

Lectures on nutrition; a series of lectures given at the Mayo Foundation and the universities of Wisconsin, Minnesota, Nebraska, Iowa, and Washington (St. Louis) 1924-1925. Philadelphia, Saunders, 1925. 243 p. Bibl. at end of each lecture.

LEVINE, VICTOR E. Acid-base equilibrium in relation to gastric acidity. *Archiv. Pediatrics* 42: 780-781 (1925). 54 references.

MCCOLLUM, ELMER V., and SIMMONDS, NINA. The newer knowledge of nutrition; the use of foods for the preservation of vitality and health. 3rd ed. N. Y., Macmillan, 1925. 675 p. Bibl., p. 569-655.

MCLESTER, JAMES S. Nutrition and diet in health and disease. Philadelphia, Saunders, 1927. 783 p. Bibl. at end of most of the chapters.

MITCHELL, H. H. The minimum protein requirements of cattle. National Research Council, Bull. No. 67. 1929. 84 p. Bibl., p. 79-84. 99 references.

MOFFETT, R. D. Review of the literature on infant feeding. *Am. J. Diseases Children* 27: 618-632 (1924); 49 footnotes. 30: 700-711 (1925); 42 footnotes.

MOILLARD, MARTIN. Nutrition de la plante. v. 1, Echanges d'eau et de substances minérales; v. 2, Formation des substances ternaires; v. 3, Utilisation des substances ternaires; v. 4, Cycle de l'azote. Paris, Doin, 1921-1925. Bibl. at end of each vol.

ROSE, MARY DAVIES (SWARTZ). The foundation of nutrition. N. Y., Macmillan, 1927. 501 p. References at end of each chapter.

VANDELDELDE, ALBERT J. J. Manuel de l'alimentation humaine. Bruxelles, de Lannoy, 1923. 274 p. Bibl. at ends of some chapters, and bibliographical footnotes.

WHEELER, RUTH. American Red Cross textbook on food and nutrition; a study of the basis of food selection. Philadelphia, Blakiston's, 1927. 123 p. Bibl., p. 118-120.

See also CORN; FOODS; METABOLISM; VITAMINS.

OCHER

REIFENBERG, A. Die Entstehung der Mediterran-Roterde (Terra rossa). *Kolloidchem. Beihefte* 28: 55-147 (1929). Bibl., p. 142-147. 146 references.

ODORS*

HAMANN, EDMUND H. The relation between structure and odor in derivatives of beta-phenylethyl alcohol, some new beta-phenylacrylic acids. Thesis, Columbia University, 1927. 30 p. Bibl., p. 29-30.

HAMPTON, FRANK A. The scent of flowers and leaves; its purpose and relation to man. Dulau, 1925. Bibl. at end of most chapters.

SKRAMLIK, EMIL v. Die physiologische Charakteristik von riechenden Stoffe. *Naturwissenschaften* 12: 824 (1924). 23 references.

OIL SHALE

ALDERSON, V. C. Oil shale bibliography. Colorado School of Mines Quart. 20, no. 1, Suppl. A: 16-24. About 160 references for 1924.

Current oil shale bibliography. *Min. Cong. J.* 8: 851, 886, 1057, 1088 (1922); 9: 37, 60, 94, 122, 202, 252, 385, 419 (1923); 10: 142, 188, 231, 284, 304, 372, 451, 528, 560 (1924); 11: 14, 196, 211, 406, 496 (1925); 12: 132, 470, 603, 764 (1926).

McKEE, R. H., *et al.* Shale oil. N. Y., Chem. Cat. Co., 1925. 326 p. P. 171-299 contains 1120 abstracts of articles from 1786 to 1925. Chronological with name and subject index. P. 300-310, patents.

MANNING, PAUL DEV. The genesis of oil shale and its relation to petroleum and other fuels. Thesis, Columbia University, 1927. 73 p. Bibl., p. 35-36, 70-71.

NEUBRONNER, KARL. Beiträge zur Kenntnis des Schieferöls aus Württemberg. Diss., Technische Hochschule, Stuttgart, 1921. 95 p. Bibl. references.

THIESSEN, REINHARDT, *et al.* Oil shales of Kentucky. A series of four economic and morphological discussions of the Devonian shales of this commonwealth. Kentucky Geol. Surv. 1920. Ser. VI. Geol. Repts. v. 21. 1925. 242 p. Bibl. references.

WOLDMAN, NORMAN E. The refining of the lower fractions of shale oil by liquid sulfur dioxide. Thesis, Columbia University, 1927. 69 p. Bibl., p. 66-67.

See also PETROLEUM.

OILCLOTH. See LINOLEUM.

OILS. See FATS, OILS, WAXES; PETROLEUM; and names of individual oils.

OILS: Analysis.

ELSDON, GEORGE D. The chemistry and examination of edible oils and fats, their substitutes and adulterants. N. Y., Van Nostrand, 1926. 521 p. Contains bibliographies.

GILL, AUGUSTUS H. A short handbook of oil analysis. 11th ed. Philadelphia, Lippincott, 1927. 293 p. References at end of some of the chapters; bibliographical footnotes.

GRÜN, ADOLF. Analyse der Fette und Wachse, sowie der Erzeugnisse der Fettindustrie. Berlin, Springer, 1925. Bibl. footnotes.

OILS: Drying.

MORRELL, ROBERT S., and WOOD, H. R. The chemistry of drying oils. London, Benn, 1925. 224 p. Bibl. at the end of each chapter.

See also LINSEED OIL; PAINT; TUNG OIL; ETC.

OILS: Recovery.*

GOODWIN, H. M., and ELLIS, R. The separation of oil from condensed water by electrolysis. Trans. Am. Electrochem. Soc. 17: 421-423 (1910).

OLEOMARGARINE. See MARGARINE.

OLIVE OIL

POMPEIAN CORPN. Bibliography *re* nutritional values of olive oil. Tariff readjustment 1929 hearings, Committee on Ways and Means, 70th Congr. 2d Sess., Jan. 9, 1929, no. 3: 522-524.

See also FATS, OILS, WAXES.

OLIVINE. See MAGNESIUM SILICATES.

OPAL. See SILICA AND SILICATES.

OPIMUM

JERMSTAD, AXEL. Das Opium; seine Kultur und Verwertung im Handel. Wien, Hartleben, 1921. 208 p. Bibl. footnotes.

OPTICAL ACTIVITY

EICHWALD, EGON. Die Arbeiten mit optisch-aktiven Kohlenstoffverbindungen. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 1: 241-290 (1925). Bibl. footnotes.

LIFSCHITZ, J. Untersuchungen über Rotationsdispersion. Z. physik. Chem. 105: 27-54 (1923). Bibl. footnotes.

Pouvoir rotatoire. In Tables annuelles V: 727-753 (1917-1922); VI: 620-679 (1923-1926).

SCHEIBLER, HELMUTH. Bestimmung des Drehungsvermögens. (Polarisation) In Houben-Weyl, Meth. org. Chem. I: 936-976 (1925). Bibl. footnotes.

SCHEIBLER, HELMUTH. Zerlegung optisch inaktiver Körper in ihre aktiven Komponenten. In Houben-Weyl, Meth. org. Chem. 3rd ed., II: 1063-1099 (1925). Bibl. footnotes; also in tables through text.

ORES

GREGORY, J. W. Magmatic ores. Trans. Faraday Soc. 20: 457-458 (1925). About 40 references.

KRAHMANN, RUDOLF. The practical application of geo-physical methods to mineral survey with special reference to the electric and magnetic methods. Berlin, Knapp, 1926. 43 p. Bibl., p. 39-43.

LINDGREN, WALDEMAR. Mineral deposits. 3rd ed. McGraw-Hill, 1928. 1049 p. Bibl. footnotes.

TAGGART, ARTHUR F., *et al.* Handbook of ore dressing. Wiley, 1927. 1679 p. Numerous references to patent literature.

See also MINERAL RESOURCES.

ORGANIC CHEMISTRY

ADKINS, H., and McILVAIN, S. M. An introduction to the practice of organic chemistry in the laboratory. N. Y., McGraw-Hill, 1925. 288 p. Bibl., p. 153-157.

CARZULY, R. Organometalle. Sammlung chem. chem.-tech. Vorträge 29: 319-428 (1927). Bibl. footnotes.

CHAMBERLAIN, JOSEPH S. A textbook of organic chemistry. 2nd ed. Philadelphia, Blakiston's, 1928. 901 p. Bibl., p. 830-831.

COHEN, JULIUS B. Organic chemistry for advanced students. 4th ed. London, Arnold, 1924. 3 v. References at end of chapters. Bibl. footnotes.

DE LANGE, M. P. The displacement of atoms and groups in the benzene nucleus. Rec. trav. chim. 45: 19-60 (1926). 200 footnotes.

FRANCIS, ALFRED W. Directive influence in the benzene ring. Chem. Reviews. 3: 257-289 (1926). 89 footnotes.

GATTERMAN, LUDWIG. Die Praxis des organischen Chemikers. 19. Aufl. Berlin, De Gruyter, 1925. 379 p. Bibl. footnotes.

HENRICH, F. Neuere Untersuchungen über organische Radikale aus den Jahren 1922-1928. Z. angew. Chem. 41: 1239-1242 (1928). 19 footnotes.

HERZOG, REGINALD O. Chemische Technologie der organischen Verbindungen, Lehrbuch. 2. Aufl. Heidelberg, Winter, 1927. 997 p. Bibl. at end of chapters.

HOUBEN, JOSEPH. Die Methoden der organischen Chemie; ein Handbuch

- für die Arbeiten im Laboratorium. 3. Aufl. Leipzig, Thieme, 1925- . Bibl. footnotes.
- LOWY, ALEX., and HARROW, BENJ. An introduction to organic chemistry. 2nd ed. N. Y., Wiley, 1928. 407 p. Bibl., p. 381-393, and at end of most of the chapters.
- MARTINET, J., and BORNAND, LOUIS. Les combinaisons moléculaires. *Rev. gén. sci.* 36:577 (1925). 48 references.
- PRINGSHEIM, HANS. Ueber die Chemie komplexer Naturstoffe. *Naturwissenschaften* 13:1084-1090 (1925). 66 footnotes.
- PUMMERER, RUDOLF. *Organische Chemie*. 2. Aufl. Dresden, Steinkopff, 1923. 210 p. Bibl. footnotes.
- RHEINOLDT, HEINRICH. Die Bestimmung organischer Molekülverbindungen mit Hilfe der thermischen Analyse. *In* Houben-Weyl, *Meth. org. Chem.* 3rd ed., I:1146-1172 (1925). Bibl. footnotes.
- UNGER, F. Neuere Arbeiten aus dem Gebiete der organischen Chemie. *Arch. Pharm.* 266:244-269 (1928). 84 footnotes.
- ORGANIC COMPOUNDS: Constitution.**
- LANGSETH, A. Ein Beitrag zur Konfigurationsbestimmung geometrisch isomerer Kohlenstoffverbindungen. *Z. physik. Chem.* 118:49-64 (1925). Bibl. footnotes.
- ORGANOMETALLIC COMPOUNDS**
- CARZULY, R. Organometalle. *Sammlungen chem. chem.-tech. Vorträge* 29:319-428 (1927). Bibl. footnotes.
- GODDARD, ARCHIBALD E., and GODDARD, DOROTHY. Organometallic compounds. I. Derivatives of the elements of groups I to IV. *Friend, Textbook of inorg. chem.*, vol. XI. 1928. 418 p.
- SCHLENK, W. Organometallverbindungen. *In* Houben-Weyl, *Meth. org. Chem.* 4:720-978 (1924). Bibl. footnotes.
- See also LEAD: ORGANIC COMPOUNDS; MAGNESIUM: ORGANIC COMPOUNDS.
- ORSAT APPARATUS***
- FIELDNER, ARNO C., JONES, G. W., and HOLBROOK, W. F. The Bureau of Mines Orsat apparatus for gas analysis. U. S. Bur. Mines, Tech. paper 320. 1925. 18 p. Bibl., p. 18.
- ORTHOCLASE.** See FELDSPAR.
- ORTHOPHOSPHORIC ACID**
- MELLOR, J. W. Orthophosphoric acid. *In his Inorg. theor. chem.* 8:967-971 (1928).
- OSMOTIC PRESSURE**
- BECK, WM. A. Cane sugar and potassium nitrate as plasmolysing agents. *Protoplasma* 1:71-72 (1926). 33 references.
- GARNER, W. E. Osmotic pressure. *International critical tables* IV:431-432 (1928). 50 references.
- PRAUSNITZ, PAUL H. Elektro-osmotische Methoden. *In* Houben-Weyl, *Meth. org. Chem.*, 3rd ed., II:1140-1154 (1925). Bibl. footnotes.
- WALTER, HEINRICH. Der Wasserhaushalt der Pflanze in quantitativer Betrachtung. München, Datterer, 1925. 97 p. Bibl. at end of sections.
- OVERVOLTAGE**
- MEUNIER, F. Le surtension électrolytique. *J. chim. phys.* 22:630-632 (1925). 75 references.
- OXIDASES**
- CHODST, R. Darstellung und Nachweis von Oxydasen und Katalasen pflanzlicher und tierischer Herkunft. Methoden ihrer Anwendung. *In* Abderhalden, *Handb. biol. Arbeitsm.* IV, pt. 1:319-410 (1925). Bibl. footnotes.
- EZELL, B. D., and CRIST, J. W. Effect of certain nutrient conditions on activity of oxidase and catalase. *Mich. Agr. Expt. Sta., Tech. Bull.* 78:22-24 (1927).
- KATSUNUMA, SEIZO. Intrazelluläre Oxydation und Indophenolblausynthese; histochemische Studie über die "Oxydasereaktion" im tierischen Gewebe. Jena, Fischer, 1924. 232 p. Bibl., p. 212-229.
- LIPSCHITZ, WERNER. Indikatormethoden zum Nachweis von Zelloxydationen. *In* Abderhalden, *Handb. biol. Arbeitsm.* IV, pt. 1:411-454 (1925). Bibl. footnotes.
- LIPSCHITZ, WERNER. Ueber den Mechanismus der Zelloxydationen und der Blausäurewirkung. *Arch. ges. Physiol.* 126:463-502 (1922). Bibl. footnotes.
- RAPER, H. S. The aerobic oxidases. *Physiol. Rev.* 8:280-282 (1928). 83 references.
- See also ENZYMES.
- OXIDATION**
- Anti-oxidation. *Ind. Eng. Chem.* 16:711 (1924). Bibl. of 22 references.
- AUBEL, E., and GENEVOIS, L. Les oxydo-réductions. *Rev. gén. botan.* 40:53-62, 120-127, 184-189, 244-250 (1928).
- DUNBROOK, RAYMOND F. The electrolytic oxidation of *p*-nitrotoluene and *p*-chlorotoluene to their respective acids. Thesis, Univ. of Pittsburgh, 1923. 26 p. Bibl., p. 25.
- HENRY, PIERRE. (The mechanism of oxidation). *Rev. gén. sci.* 39:16-22 (1928). 58 references.

OXIDATION—Cont'd

STOERMER, R. Oxydation. In Houben-Weyl, Meth. org. Chem., 3rd ed., II: 1-222 (1925). Bibl. footnotes.

STOERMER, R. Oxydation und Reduktion. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2, 1st half: 1-456 (1927). Bibl. footnotes.

OXIDATION-REDUCTION POTENTIALS.

BILMANN, EINAR. Oxidation and reduction potentials of organic compounds. Trans. Faraday Soc. 19: 676-691 (1924). Bibl., p. 690-691.

CANNAN, R. K., COHEN, BARNETT, and CLARK, W. MANSFIELD. Studies on oxidation-reduction. X. Reduction potentials in cell suspensions. Public Health Repts., Suppl. no. 55. 34 p. Bibl., p. 33-34.

CLARK, W. MANSFIELD. Recent studies on reversible oxidation-reduction in organic systems. Chem. Reviews 2: 175-178 (1925). 60 references.

CLARK, W. MANSFIELD, COHEN, B., and GIBBS, H. D. Studies on oxidation-reduction. IX. A potentiometric and spectrophotometric study of meriquinones of the *p*-phenylenediamine and the benzidine series. Public Health Repts., Suppl. no. 54, 1926. 61 p. Bibl., p. 60-61.

CONANT, JAMES B. The electrochemical formulation of the irreversible reduction and oxidation of organic compounds. Chem. Reviews 3: 37-40 (1926). 45 references.

HYGIENIC LABORATORY. *Division of Chemistry*. Studies on oxidation-reduction. I-X. Hygienic Lab., Bull. no. 151. 1928. 363 p. Bibl. at end of each section. Parts XI-XIV published as supplements 61, 66, 69 and 71 to Public Health Reports, 1927-1928. Each part has a bibl.

JETTE, ERIC R. Oxidation-reduction reactions in inorganic chemistry. N. Y., Century, 1927. 152 p. Bibl. at end of some of the chapters.

OXONIUM COMPOUNDS *

KEHRMANN, F. Oxonium-Verbindungen. In Houben-Weyl, Meth. org. Chem. 2nd ed., III: 317-376 (1923). Bibl. footnotes.

OXYGEN

FINLAYSON, T. C. Industrial oxygen. Trans. Instn. Chem. Eng. 1923, I: 3-87. 65 references on p. 79.

FRIEND, J. N., and TWISS, D. F. Oxygen. Friend, Textbook inorganic chemistry VII, pt. 1. 1924. 370 p. Bibl. footnotes.

LEY, H. Sauerstoff. In Abegg, Handb. anorg. Chem., 4, pt. 1, 1st half: 101-109 (1927). 355 references.

Patent literature on oxygen production, 1849-1915. Trans. Instn. Chem. Eng. 1: 80-82 (1923).

See also AIR; ATMOSPHERE; OZONE.

OXYPROTEIC ACIDS *

ASCOLI, RUGGERO. Lo stato attuale delle nostre conoscenze sugli acidi ossiproteinici. Biochim. terapia sperimentale 14: 281-282 (1927). 75 references.

OYSTERS *

HUNTER, ALBERT C., and HARRISON, CHANNING W. Bacteriology and chemistry of oysters, with special reference to regulatory control of production, handling and shipment. U. S. Dept. Agr. Bull. 64: 1-75 (1928). 106 references on p. 70-75.

OZONE

FRIEND, J. N., and TWISS, D. F. Ozone. In Friend, Textbook inorg. chem. VII, pt. I: 138-155 (1924). Bibl. footnotes.

GRÄFENBERG, LEOPOLD. Beiträge zur Kenntnis des Ozons. 1903. (Inaug.-Diss., Göttingen.) Bibl. footnotes.

GRIFFITH, R. O., and MCKEOWN, A. Die photochemische und thermische Ozonersetzung. Z. physiol. Chem. 120: 236-244 (1926). Bibl. footnotes.

LEY, H. Ozon. In Abegg, Handb. anorg. Chem. 4, pt. 1, 1st half: 109-113 (1927). 179 references.

SCHWAB, GEORG-MARIA. Ueber Ozon. Z. physik. Chem. 110: 599-625 (1924). Bibl. footnotes.

See also OXYGEN.

OZONIDES *

FONROBERT, EWALD. Ozonide. In Houben-Weyl, Meth. org. Chem. 2nd ed., III: 271-316 (1923). Bibl. footnotes.

PAINT

BEARN, J. G. Chemistry of paints, pigments and varnishes. London, Benn, 1923. 277 p. Bibl., p. 254-255.

FOX, JOHN J., and BOWLES, T. H. The analysis of pigments, paints and varnishes. London, Benn, 1927. 179 p. Bibl. at end of chapters.

VAN HOEK, C. P. Titanweiss. Farben-Ztg. 31: 2296-2298 (1926). 42 references.

VAN HOEK, C. P. Die Weisspigmente und ihr Verhalten gegenüber ultravioletten Strahlen. Farben-Ztg. 34: 1008-1009, 1068 (1929). 113 references.

LADOO, R. B. Mineral pigments. In his Non-metallic minerals, 390-391 (1925). 18 references.

NELSON, HARLEY A., and NORRIS, WAYNE C. Pigments in nitrocellulose lacquer enamels. N. J. Zinc Co., Res. Bull., Sept., 1927. 27 p. and suppl. Bibl., p. 25-27. 58 references.

PORRITT, B. D. Some problems of the paint and rubber industries. J. Oil Colour Chem. Assoc. 8:153-154 (1925). 35 references.

SOCIETY OF CHEMICAL INDUSTRY. Paint, pigments, varnishes and resins. In Reports of the progress of applied chemistry 10:334-403 (1925); 231 footnotes. 11:341-392 (1926); 190 footnotes. 12:346-397 (1927); 221 footnotes. 13:381-424 (1928); 154 footnotes.

TOCH, MAXIMILIAN. The chemistry and technology of paints. 3rd ed. N. Y., Van Nostrand, 1925. 413 p. Bibl., p. 403-405.

WOLFF, H. Uebersicht über die Literatur der Anstrichstoffe und ihrer Rohstoffe im Jahre 1927. Chem. Umschau 35:218-221, 228-232, 256-258 (1928). References and patents through text.

See also LACQUERS; MINERAL PAINTS; OILS; DRYING; RESINS; VARNISHES.

Serial

Current bibliography. In J. Oil Colour Chem. Assoc. 7:222-228, and succeeding numbers.

RESEARCH ASSOC. OF BRITISH PAINT, COLOR AND VARNISH MANUFACTURERS. Review of current literature relating to the paint, colour and varnish industries. No. 1, Teddington, 1928.

PALEOCHEMISTRY*

MACALLUM, A. B. Paleochemistry of the body fluids and tissues. *Physiol. Rev.* 6:355-357 (1926).

PALLADIUM SILICIDES. See SILICIDES.

PANCREAS

CHOAY, ANDRE. Hypothèses sur la nature de la sécrétion interne du pancréas et sur le mécanisme de son action. *Bull. soc. chim. biol.* 8:879-889 (1926). 159 references.

LESSER, E. J. Die innere Sekretion des Pankreas. In Oppenheimer, Handb. Biochem. 2nd ed., 9:159-228 (1925). 273 footnotes.

LESSER, E. J. Pankreas und seine Sekret. In Oppenheimer, Handb. Biochem. 4:577-594 (1924). 118 footnotes.

RENARD, A. Étude pharmacologique des ferments de la poudre de pancréas. Tours, Cottier, 1922. 94 p. Bibl., p. 93-94.

See also DIGESTION.

PAPER

CHRISTIANSEN, C. Ueber Natronzellstoff. Berlin, Borntraeger, 1913. 154 p. Bibl. footnotes; bibl., p. 134-154.

DIECKMANN, RICHARD. Die Fabrikation des Zellstoffes aus Holz. Berlin, Elsner, 1923. Bibl. footnotes.

FRANKE, KURT W. Measurement of hydrogen-ion concentration in the control of pulp and paper manufacture. Thesis, Univ. of Minnesota, 1927. 24 p. Bibl., p. 23-24.

HÄGGLUND, ERIK. Natronzellstoff. Berlin, Elsner, 1926. 360 p. Bibl. footnotes.

HAMILL, GEORGE K., *et al.* Use of glue in coated paper. U. S. Bur. Standards, Tech. Papers no. 323. 32 p. Bibl., p. 662-663.

HAUSEN, J. Alkalis as bases for sulphite liquor. Paper Trade J. 84, no. 9:51-60 (1927). 61 footnotes.

Paper deinking processes which are subjects of patents. Paper Makers' Mo. J. 62, no. 12:507-509 (Dec., 1924); Paper 35, no. 12:509-510 (Jan. 8, 1925).

PAPERMAKERS' ASSOC. OF GREAT BRITAIN AND IRELAND. *Technical Section*. Bibliography of periodical publications on papermaking and allied subjects issued during 1924. London, The Assoc., 1925. 37 p. Classified. 1925. 48 p. 1926. 44 p. 1927. 40 p.

POMILIO, UMBERTO. L'industria nazionale della cellulose. *Giorn. chim. ind. appl.* 6:236-237 (1924). 56 references.

ROSSMAN, JOSEPH. Latex sizing by the beater method. Paper Trade J. 86, no. 22:45-46 (May 31, 1928); Paper Makers' Mo. J. 66:310-311 (1928). 10 patents.

ROSSMAN, JOSEPH. Manufacture of photographic paper. Paper Trade J. 88, no. 7:59-64 (1929). 33 patents.

ROSSMAN, JOSEPH. Vulcanized fiberboard. Paper Trade J. 88, no. 5:69-71 (1929). 39 patents.

ROSSMAN, JOSEPH. The manufacture of safety paper. I. Special paper structure. Paper Trade J. 87, no. 10:61-64 (Sept. 6, 1928); Papierfabr. 27:295-296 (1929). 35 patents.

ROSSMAN, JOSEPH. The manufacture of safety paper. II. Chemical surfacing of paper. Paper Trade J. 87, no. 12:56-60 (Sept. 20, 1928); Papierfabr. 27:296-299 (1927). 93 patents.

ROSSMAN, JOSEPH. Processes for deinking paper. Paper Trade J. 87, no. 3:50-55 (July 19, 1928). 85 patents.

ROSSMAN, JOSEPH. Sulphate process patent review. Paper Trade J. 87, no. 6:57-59 (Aug. 9, 1928). 17 patents.

PAPER—Cont'd

- ROWE, J. W. Effect on cellulose fibers of treatment in the papermakers' beater. *Proc. Tech. Sect., Papermakers' Assoc. Gt. Brit. Ireland* 8, pt. 1: 221 (1927). 62 references.
- RUE, JOHN D. Semi-cellulose and semi-chemical pulping. *Paper Trade J.* 81, no. 16: 57-59 (1925). References through text.
- RUE, JOHN D. Soluble sulphites and their bisulphites in the pulping of wood. A review of the literature. *Paper Trade J.* 81, no. 16: 54-56 (1925). References through text.
- SCHROHE, A. Neue Vorschläge zur Verwertung der Zellstoff-Ablaugen insbesondere in der Patentliteratur der Jahre 1925, 1926 und 1927. *Papierfabr.* 26: 241-247 (1928). Patents through text.
- SCHROHE, A. Umschau über das Gebiet der Patentliteratur der chemischen Verfahren zur Herstellung reiner und veredelter Zellstoffe und Faserstoffe, 1898-1925. *Papierfabr.* 23: 655-658, 665-668, 687-689 (1925).
- SCHROHE, A., and WEST, C. J. Waste liquors and gases of the paper industry. Survey of the recent domestic and foreign literature on the utilization of waste liquors and waste gases of the pulp industry, 1912-1924. *Papierfabr.* 23, no. 3: 30-33; no. 5: 63-65; no. 7: 89-92; no. 10: 158-161; no. 15: 251-253; no. 17: 284-287; no. 18: 293-296; no. 19: 306-307 (1925). *Translation with additions* by C. J. West in *Paper Trade J.* 81, no. 14: 62-64; no. 15: 54-56; no. 17: 56-58; no. 18: 106-108; no. 19: 57-59; no. 20: 54-56; no. 21: 57-58; no. 22: 55-56; no. 23: 61-63; no. 24: 50-52; no. 25: 47-50; no. 26: 50-52 (Oct. 1-Dec. 24, 1925); *Tech. Assoc. Papers* 9: 146-181 (1926). *German original reprinted with additions of indexes under the title: Die Verwertung der Zellstoff Ablaugen.* Berlin, Elsner, 1925. 140 p.
- SCHUBERT, MAX. Die Praxis der Papierfabrikation mit besonderer Berücksichtigung der Stoffmischungen und deren Kalkulationen. Praktisches Handbuch für Papierfabrikanten, technische und kaufmännische Direktoren, Werkführer, sowie zum Unterricht in Fachschulen. 3. Aufl. Berlin, Krayn, 1922. 483 p. Bibl. footnotes.
- SHAW, MERLE B., and BICKING, GEORGE W. A comparative study of paper fillers. *U. S. Bur. Standards, Tech. Papers* no. 301. 1925. Bibl., p. 747-748.
- SUTERMEISTER, EDWIN. Chemistry of pulp and paper making. 2nd ed. N. Y., Wiley, 1929. 565 p. Bibl. footnotes.
- WALTON, ROBERT P. Causes and prevention of deterioration in book materials. *Bull. N. Y. Pub. Library* 33: 235-266 (1929). Preservation and durability of book papers, p. 236-251. Annotated. Also issued as a separate. 39 p.
- WENZL, HERMANN. Zellstoffherzeugung mit Hilfe von Chlor. Berlin, Borntraeger, 1927. 80 p. A bibliography of 41 items; a list of 52 patents and 72 footnotes.
- WEST, CLARENCE J. Bibliography of papermaking for 1928. *Paper Trade J.* 88, no. 8: 173-231 (1929). Odd pages only. *Tech. Assoc. Papers* 12: 147-177 (1929).
- WEST, CLARENCE J. Bibliography of pulp and paper making, 1900-1928. N. Y., Lockwood Trade Journal Co., 1928. 982 p. Classified.
- WEST, CLARENCE J. Reading list on papermaking materials. 2nd ed. N. Y., Lockwood Trade Journal Co., 1928. 239 p.
- WEST, CLARENCE J. U. S. papermaking patents for 1920. *Paper* 27, no. 20: 19-21; no. 21: 25-27 (Jan. 19, 26, 1921).
- WEST, CLARENCE J. U. S. patents on papermaking, 1926. *Tech. Assoc. Papers* 10, no. 1: 168-170 (1927). *Paper Trade J.* 84, no. 17: 56-58 (Apr. 28, 1927).
- WEST, CLARENCE J. U. S. patents on papermaking, 1927. *Paper Trade J.* 84, no. 19: 47-48; no. 23: 47. 85, no. 3: 54; no. 8: 55; no. 25: 45 (May 12, June 9, July 21, Aug. 25, Dec. 22, 1927); 86, no. 2: 56; no. 4: 51 (Jan. 12, 26, 1928); *Tech. Assoc. Papers* 11, no. 1: 280-284 (1928); *Pulp Paper Mag. Can.* 26, no. 2: 48-49 (Jan. 12, 1928).
- WEST, CLARENCE J. U. S. patents on papermaking, 1928. *Paper Trade J.* 86, no. 18: 68 (May 3, 1928); 87, no. 5: 58-59 (Aug. 2, 1928); no. 16: 37-38 (Oct. 18, 1928); *Tech. Assoc. Papers* 12: 191-195 (1929).
- WEST, CLARENCE J., and PAPINEAU-COUTURE, A. Bibliography of papermaking, 1924. *Paper Trade J.* 80, no. 7: 51-54; no. 8: 53-56; no. 9: 51-54; no. 10: 63-66; no. 11: 59-62; no. 12: 55-58; no. 13: 51-54; no. 15: 54-58; no. 16: 54-57 (Feb. 12-Apr. 16, 1925); *Tech. Assoc. Papers* 8: 110-144 (1925). 1925. *Paper Trade J.* 82, no. 10: 53-56; no. 11: 56-60; no. 12: 51-56; no. 13: 62-68; no. 14: 47-51; no. 15: 55-59; no. 16: 41-43 (Mar. 11-

- Apr. 22, 1926); Tech. Assoc. Papers 9: 182-214 (1926). 1926. Paper Trade J. 84, no. 8: 217-260 (Feb. 24, 1927); Tech. Assoc. Papers 10, no. 1: 146-167 (1927). 1927. Paper Trade J. 86, no. 8: 219-259 (odd pages only) (Feb. 23, 1928); Tech. Assoc. Papers 11, no. 1 (1928).
- WEST, CLARENCE J., and SCRIBNER, B. W. Paper research literature (VII). Revised. A list of contributions by members of the U. S. Bureau of Standards, 1910 to Dec. 31, 1924. Paper Trade J. 80, no. 21: 46-52 (May 21, 1925). First supplement, Paper Trade J. 82, no. 20: 49 (May 20, 1926). Second supplement, Paper Trade J. 84, no. 23: 45-46 (June 9, 1927). Third supplement, Paper Trade J. 86, no. 17: 51-52 (Apr. 26, 1928). Fourth supplement, Paper Trade J. 88, no. 16: 57 (Apr. 18, 1929).
- YOUNG, CHARLES L. Wallpaper and wallpaper hanging. N. Y., Century Co., 1926. 293 p. Contains a bibl.
See also CELLULOSE.
- PAPER: Testing.**
CARSON, F. T. Measurement of the degree of sizing of paper. Bur. Standards, Tech. Paper no. 326. 1926. 30 p. Bibl., p. 730-732. Paper Trade J. 84, no. 11: 43-44 (Mar. 17, 1927). 50 references.
- TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Paper testing methods; microscopical, chemical and physical processes and apparatus employed, prepared by the Committee on Paper Testing, TAPPI. N. Y., Lockwood Trade Journal Co., 1928. 126 p. Bibl., a partial list of reference books and articles in periodicals, p. 120-124.
- PARACYMENE.** See CYMENE.
- PARATHYROID**
COLLIP, J. B. The parathyroid glands. Medicine 5: 55-57 (1926).
- DRAGSTEDT, LESTER R. The physiology of the parathyroid glands. Physiol. Rev. 7: 525-530 (1927).
- PASSIVITY**
EVANS, ULICK R. Passivity and overpotential. Trans. Faraday Soc. 18: 1-13 (1922). Bibl. footnotes.
- PATENTS**
VAUGHAN, F. L. Economics of our patent system. N. Y., Macmillan, 1925. 288 p. Bibl., p. 265-277. About 300 references.
- PEARL ESSENCE ***
TAYLOR, HARDEN F. Pearl essence, its history, chemistry and technology. U. S., Bur. Fisheries, Doc. 989. 1925. 15-36 p. Bibl., p. 35-36.
- PEARLS ***
BOUTAN, L. M. A. La perle; étude générale de la perle, histoire de la méléagrine et des mollusques producteurs de perles. 1925. Bibl. footnotes.
- PEAT**
ATWOOD, ALICE C. Peat: a contribution towards a bibliography of the American literature through 1925. U. S. Dept. Agr. Library, Bibl. Contr. 12 (1926). 95 p. Mimeographed.
- DACHNOWSKI, ALFRED P. Factors and problems in the selection of peat lands for different uses. U. S. Dept. of Agr., Dept. Bull. no. 1419. 1926. 24 p. Bibl., p. 22-23.
- HAANEL, B. F. Peat, its manufacture and use. Final report of the peat committee appointed jointly by the Governments of the Dominion of Canada and the Province of Ontario. Ottawa, 1926. 298 p. Bibl., p. 288-292.
- NEGRE, GEORGES. La tourbe, formation—gisements français—exploitation—traitement—utilisation industrielle. Paris, Doin, 1927. 240 p. Bibl., p. 225-232.
- SCHREIBER, HANS. Moorkunde nach dem gegenwärtigen Stande des Wissens auf Grund 30-jähriger Erfahrung. Berlin, Parey, 1927. 192 p. Bibl. footnotes.
- WAKSMAN, S. A., and STEVENS, K. R. Chemical nature of organic complexes in peat and methods of analysis. Soil Science 26: 136-137 (1928). 37 references.
- PECHMANN DYES ***
HOWELLS, HENRY P. A contribution to the solution of the "Pechmann dyes" problem. The chemistry of acyl paraquinones. Thesis, Columbia Univ., 1927. 38 p. Bibl., p. 37-38.
- PECTIN**
AHMANN, C. F., and HOOKER, H. D. The estimation of pectin and a study of the constitution of pectin. Missouri Agr. Expt. Sta., Res. Bull. 77. 1925. 39 p. Bibl., p. 38-39.
- CARRÉ, M. H., and HORNE, A. S. Investigation of the behavior of pectic materials in apples and other plant tissues. Ann. Bot. 41: 233-235 (1927).
- CONRAD, CARL M. A biochemical study of the insoluble pectic substances in vegetables. Am. J. Botany 13: 546-547 (1926).
- DAVISON, FORREST R. The pectic enzymes. Bot. Gaz. 83: 359-361 (1927).
- EDSON, LUCIA E. A physico-chemical study of pectin. Thesis, Columbia Univ., 1928. 30 p. Bibl., p. 30.

PECTIN—Cont'd

- EHRlich, F. Neue Untersuchungen über Pektinstoffe. *Z. angew. Chem.* 40: 1305-1310 (1927). Bibl. footnotes.
- JOHNSTIN, RUTH F. Calcium-pectin equilibrium in pectin water sol. Thesis, Ohio State Univ., 1926. 35 p. Bibl., p. 33-34.
- MYERS, P. B., and BAKER, J. L. Rôle of pectin: The viscosity and jelling properties of pectin solutions. *Del. Agr. Expt. Sta., Bull.* 149: 44-46 (1927).
- POORE, HOMER D. Citrus pectin. *U. S. Dept. Agr., Dept. Bull.* no. 1323. 1925. 19 p. Bibl., p. 16-19. 61 references.
- ROOKER, WILLIAM A. Fruit pectin; its commercial manufacture and uses; including a chapter on patents on the manufacture and use of pectin, by Milo R. Daughters. *N. Y., Avi Publ. Co.,* 1928. 170 p.
- WILSON, C. O. The manufacture of pectin. *Ind. Eng. Chem.* 17: 1067 (1925). 31 references.

PEPTIZATION*

- SLATER, A. V. Peptisation. *J. Soc. Chem. Ind.* 44: 505-506T (1925). 56 references.

See also COLLOIDS.

PERCARBONIC ACID*

- MELLOR, J. W. Percarbonic acid and the percarbonates. *In his Inorg. theor. chem.* 6: 87 (1925). About 40 references.

PERCHLORIC ACID

- Ueberchloressäure. *In Gmelin's Handb. anorg. Chem.,* 8 Aufl., System Nummer 6 (1927): 362-409. Bibl. through text.

PERFUMES

- CUINASSE, L. Memorial du parfumeur chimiste. Paris, Librairie le Francois, 1924. 347 p. Bibl., p. 337-338.
- KNOLL, RUDOLF. Synthetische und isolierte Riechstoffe und ihre Herstellung. 2. Aufl. Halle, Knapp, 1928. 257 p. Bibl., 6th prelim. leaf.
- ROUX, CLAUDIUS. Les produits odorants d'origine animale (avec gravures hors-texte). Lyon, Éditions scientifiques "Parfumerie moderne," 1924. 39 p. Bibl., p. 37-39.

See also DYES (Doyle); ESSENTIAL OILS.

PERIODIC SYSTEM*

- DUSHMAN, SAUL. Line spectra and the periodic arrangement of the elements. *Chem. Reviews* 5: 170-171 (1928). 37 references.
- PANETH, FRITZ. Das periodische System der chemischen Elemente. *Ergeb. exakt. Naturwissenschaften* 1: 400-403 (1922). 116 references.

PERMEABILITY

- HAMBURGER, H. J. Die zunehmende Bedeutung der Permeabilitätsprobleme für Physiologie und Pathologie. *Ergeb. Physiol.* 23, I: 77-82 (1924). 98 references.
- SÜNDERHAUF, RICHARD. Untersuchungen über den Permeabilitätsquotienten mittels der Walterschen Brommethode. *Z. ges. exptl. Med.* 55: 398-402 (1927).
- WEBER, FRIEDL. Permeabilität der Pflanzenzelle und künstlicher Membranen. *Protoplasma* 1: 486-496 (1926).
- WERTHEIMER, ERNST. Untersuchungen über die Permeabilität eines isolierten überlebenden Membrans. *Protoplasma* 2: 602-629 (1927). Bibl. footnotes.
- WIERINGA, KLASS T. Quantitative permeabilitätsbepaligen. Proefschrift, Wageningen, 1928. 77 p. Bibl., p. 71-77.

See also OSMOTIC PRESSURE.

PEROXIDES*

- SONN, A. Superoxyde. *In Houben-Weyl, Meth. org. Chem.,* 2nd ed., III: 250-270 (1923). Bibl. footnotes.

PERYLENE

- MASON, FREDERICK A. Chemistry of perylene. *Ind. Chemist.* 5: 111-114 (1929). Review with bibl.
- ROUX, A., and MARTINER, JH. Le perylene. *Rev. gén. mat. color* 29: 105 (1925). 49 references.

PETROLEUM

- BAIN, HARRY F. Ores and industry in the Far East; the influence of key mineral resources on the development of oriental civilization. *N. Y., Council on Foreign Relations, Inc.,* 1927. 229 p. Bibl., p. 217-222.
- BRITTON, H. Recent articles on petroleum and allied subjects. *U. S. Bur. Mines. Mimeographed.* Appears monthly.
- BRITTON, H., and MILLER, H. C. Bibliography of fire hazards and prevention and safety in the petroleum industry. I. Fire hazards and prevention. II. Safety and safety devices. *U. S. Bur. Mines,* July, 1925. 31 and 13 p. Mimeographed.
- BUTLER, JOE B. Descriptive bibliography on oil and fluid flow and heat transfer in pipes. School of Mines and Metallurgy, Univ. of Missouri. Technical series Bulletin, v. 9, no. 4. 1926. 62 p.
- CHALLENGER, F. Sulphur compounds and certain other ingredients of mineral oils. *J. Inst. Pet. Tech.* 12: 129-134 (1926). Classified bibl.

- CLAPP, F. G., *et al.* Petroleum and natural gas resources of Canada. Can. Dept. Mines, Mines Br., no. 291. vol. 1., 378 p. Vol. 2, 404 p. Bibl., vol. 1: 345-359.
- CROSS, ROY. A handbook of petroleum, asphalt and natural gas; physical and chemical properties, specifications, methods of analysis, economics and statistics, refining processes, patents, tables and bibliography. (1928 revision). Kansas City, Mo., 1928. 832 p. Kansas City Testing Lab. Bull. no. 25. Bibl., p. 790-799; patents, p. 766-789.
- DOW, DONALD B. Oil-field emulsions. U. S. Bur. Mines, Bull. 250. 1926. 112 p. Bibl., p. 105-108.
- EGLOFF, GUSTAV. The cracking process: A universal source of motor fuel. Universal Oil Products Co., Research Labs., Chicago. 87 p. Bibl. of the industry for 1926 to 1928.
- EGLOFF, G., and LOWRY, C. D., JR. Cracking. J. Inst. Pet. Tech. 14: 558-621 (1928). Bibl. footnotes; abstracts of patents through text.
- EICHWALD, EGON. Mineralöle. Leipzig, Steinkopff, 1925. 151 p. Bibl. footnotes.
- GEORGE, HAROLD C., and CLOUD, W. F. Oil sands and production relations. Oklahoma, Geol. Surv., Bull. no. 43. 1927. 142 p. Bibl. footnotes. Bibl., p. 141-142.
- GRUSE, WM. A. Petroleum and its products. A chemical discussion of the properties, refining and utilization of petroleum. N. Y., McGraw-Hill, 1928. 377 p. Bibl. footnotes.
- HLAUSCHEK, HANS. Aufgaben und Arbeitsweisen der Oelgeologie. Halle, Knapp, 1928. 112 p. Bibl., p. 111-112.
- HOYT, MARY E. Petroleum, a selected bibliography. Quarterly of the Colorado School of Mines 22, no. 2. 1928. 25 p.
- JILLSON, WILLARD R. New oil pools of Kentucky; an indexed collection of twelve separate papers on oil and gas, Kentucky's mineral resources, progress of topographic mapping and Geological survey administration in 1922 and 1923. Kentucky. Geol. Surv. ser. 6, Geol. Repts. v. 12. 1926. 394 p. Bibl. at end of most of the papers.
- JOHNSON, ROSWELL H. A series of six radio talks on oil and gas. Univ. of Pittsburgh. Radio Publ. no. 19. 1926. 44 p. Bibl., p. 43-44.
- KAUENHOWEN, WALTER. Die Verwässerung von Erdölfeldern; ihre Ursachen und Bekämpfung. Berlin, Springer, 1928. 80 p. Bibl., p. 78-80.
- KISSLING, R. Chemische Technologiedes Erdöls. 2nd ed. 1924. Bibl. on origin of petroleum, p. 102-104; bibls. on economic relations of petroleum, p. 113-120; 149-150; list of patents on distilling apparatus, p. 225-227, 238-239; dehydration of petroleum, p. 354-355; list of refining patents, p. 407-409; footnotes and refs. through text.
- KISSLING, R. Die Erdölindustrie in den Jahren 1922-1925. Chem.-Ztg. 50: 817-818, 837-839, 865-868, 877-879 (1926). 448 footnotes.
- KISSLING, R. Fortschritte auf dem Gebiete der Erdölindustrie im Jahre 1924. Chem. Umschau Fette Oele Wachse Harze 32: 285-290, 297-303 (1925). Bibl. through text. 1925. 33: 261-267 (1926); 177 footnotes.
- KISSLING, R. Die Erdölindustrie. 1926. Fortschrittsber. Chem.-Ztg. no. 3: 78-84 (1927); 422 footnotes. 1927. *Ibid.* no. 4: 118-124 (1928). 376 footnotes. 1928. *Ibid.* no. 2: 61-68 (1929). 437 footnotes. Books, p. 68.
- KISSLING, R. Die Erdölindustrie. 1926. Chem. Umschau Fette, Oele Wachse Harze 34: 231-236, 243-247 (1927); 435 references. 1927. 35: 126-131, 145-149 (1928); 411 references.
- KISSLING, R. Die Erdölindustrie im Jahre 1927. Erdöl u. Teer 4: 440-442, 458-459, 475-478 (1928). 362 bibl. footnote references; bibl. of books, p. 477-478.
- KISSLING, R. Fortschritte und Forschungen auf dem Gebiete der Erdölindustrie im Jahre 1927. Petroleum 24: 1314-1318 (1928). References through text.
- KRÜGER, KARL, and POSCHARDT, G. R. Die Erdöl-Wirtschaft der Welt. Stuttgart, Schweizerbart, 1926. 494 p. Bibl., p. 491-494.
- LESLIE, E. H., and GENIESSE, J. C. Petroleum, petroleum products and commercial oils of mineral origin. International critical tables II: 160-161 (1927). 225 references.
- LILLEY, ERNEST R. The geology of petroleum and natural gas. N. Y., Van Nostrand, 1928. 524 p. Bibl. at end of most of the chapters.
- LILLEY, ERNEST R. The oil industry, production, transportation, resources, refining, marketing. N. Y., Van Nostrand, 1925. 548 p. Contains bibls.
- MACFARLANE, J. M. Fishes the source of petroleum. N. Y., Macmillan, 1924. 451 p. Bibl., p. 425-432.
- Mexico. *Departamento de petróleo*. Bibliografía del petróleo en Mexico. Monografías bibliograficas mexicanas, num. 8. 1927. 169 p.

PETROLEUM—Cont'd

- NAPHTALI, M. Fortschritte auf dem Gebiete der Mineralöle. *Z. angew. Chem.* 42: 508-518 (1929). 79 footnotes.
- NEUMANN, B. (Petroleum distillation and rectification.) *Ergänzungswerk* to Muspratt, 1917, v. 1: 71.
- PITKETHLY, R., and DUNSTON, A. E. Cracking. *J. Inst. Pet. Tech.* 10: 631-640 (1924); 17 footnotes. 11: 361-369 (1925); 32 footnotes. 12: 393-403 (1926); 56 footnotes.
- POSEWITZ, T. Petroleum und Asphalt in Ungarn. *Mitt. Jahrb. kgl. Ungar. Geol. Anstalt* 15: 239-465. Chronological bibl., p. 239-249. 233 references. Classified bibls. through text.
- RAKUSIN, M. A. Die Untersuchung des Erdöls und seiner Produkte. Braunschweig, Vieweg, 1906. Bibl., p. 256-259.
- REDFIELD, A. H. Petroleum supply of Japan. *Eng. Min. J. Press* 120: 417-419 (1925).
- Reports on the progress of naphthology. 1923. *J. Inst. Pet. Tech.* 10: 607-686 (1924). 1924. 11: 329-424 (1925). 1925. 12: 351-437 (1926). 1927. 14: 505-680 (1928). Bibl. footnotes.
- ROGERS, G. S. Relation of sulphur to variation in the gravity of California petroleum. *Am. Inst. Min. Eng. Bull.* no. 127: 102-103 (1917); *Trans.*, 57: 989-1005 (1918). 35 footnotes.
- Selected bibliography on petroleum technology. Publ. weekly in *National Petroleum News*.
- SINGER, L. Erdölprodukte für die Zwecke der Beleuchtung und Beheizung. *Petroleum* 24: 1125-1129 (1928). 71 footnotes.
- SINGER, L. Fortschritte der Erdöldestillationstechnik. *Petroleum* 24: 531-548, 603-610 (1928). 369 footnotes.
- SINGER, L. Lagerung und Transport von Mineralölen. *Petroleum* 24: 373-376 (1928). 72 references.
- SINGER, L. Neues aus der Krackindustrie. *Petroleum* 24: 177-193 (1928). 203 footnotes. 25: 741-748 (1929). 108 footnotes.
- SINGER, L. Neues über Treibmittel. *Petroleum* 25: 513-524 (1929). 466 footnotes.
- SOCIETY OF CHEMICAL INDUSTRY. Mineral oils. *In* Reports of the progress of applied chemistry 10: 66-96 (1925); 172 footnotes. 11: 76-86 (1926); 46 footnotes. 12: 75-86 (1927); 50 footnotes. 13: 92-108 (1928); 34 footnotes.
- SPIELMANN, PERCY E. La gnsis du ptrole. *Rev. gn. sci.* 36: 120 (1925).
- STOLLER, JAKOB. Das Erdlgebiet Hnigsen-Obershagen-Nienhagen in der sdlichen Lneburger Heide. Berlin, Preussische geologische Landesanstalt, 1927. 97 p. Bibl. references.
- TYPKE, —. Ueber die Verwendung der Bleicherden in der Minerallindustrie. *Petroleum* 24: 673-692 (1928). 237 footnotes.
- WOLFF, HELLMUTH. Die Erdlwirtschaft, 1919-1924. Leipzig, Hirzel, 1925. 802 p. Bibl., p. 570-573.
- ZIEGLER, VICTOR. Oil-well drilling methods. N. Y., Wiley, 1923. 257 p. Bibl., p. 247-249.
- See also FUELS; GASOLINE; KEROSENE; OIL SHALES; PYROGENESIS.

PETROLEUM: Analysis.*

- ALLEN, I. C., and ROBERTSON, I. W. Method of determining the sulphur content of fuels, especially petroleum products. *Bur. Mines., Tech. Paper* no. 26. 1912. 13 p. Bibl. footnotes.
- BROWNING, J. S. Analysis and testing of petroleum. *J. Inst. Pet. Tech.* 10: 628-631 (1924); 23 footnotes. 11: 357-361 (1925); 31 footnotes. 12: 416-420 (1926); 31 footnotes.
- SINGER, L. Ueber Neuerungen auf dem Gebiete der Minerallanalyse und Minerallindustrie im Jahre 1912. *Chem. Rev. Fett.-Harz-Ind.* 20: 106-109, 136-139, 159-164, 187-192, 209-213, 244-248, 262-264 (1912). Bibl. of 27 titles.

PHARMACEUTICALS

- BACKMAN, E. LOUIS. ber die Einwirkung einiger Pharmaka und Organextrakte aus autonom innervierte Organe. *Ergeb. Physiol.* 25: 664-817 (1926). Bibl. p. 664-674.
- FOURNEAU, ERNEST. Organic medicaments and their preparation. Philadelphia. Blakiston, 1925. Bibl., p. 256-257.
- HOUBEN, JOSEPH. Fortschritte der Heilstoffchemie. German patents, 1877-1917. Berlin und Leipzig, de Gruyter. 4 vols., 1926-1928.
- KRANTZ, JOHN C. A treatise on pharmaceutical chemistry, embracing certain special topics of analytical, organic, and physical chemistry as they are related to pharmacy. St. Louis, Mosby, 1928. 282 p. Bibl. at end of most of the chapters.
- MAMELI, EFISIO, and FILIPPI, EDOARDO. Azione biotermica delle sostanze organiche. *Ann. chim. appl.* 16: 556-602 (1926). 63 footnotes.
- Materia medica. *Index-Cat. S. G. O.*, 3rd ser., 7: 1006-1011 (1928).

RABOW, S. Uebersicht der im Laufe des Jahres 1924 bekannt gewordenen therapeutischen Neuheiten einschliesslich der Spezialitäten und Geheimmittel. 1924. Chem.-Ztg. 49: 265-266, 301-302, 338-339, 362-363 (1925); 190 footnotes. 1925. *Ibid.* 50: 93-94, 99-100, 127-128, 137-138, 149-150 (1926); 282 footnotes. 1926. Fortschrittsber. der Chem.-Ztg. no. 1: 1-7 (1927); 332 footnotes. 1927. *Ibid.*, no. 1: 18-23 (1928); 211 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Fine chemicals, medicinal substances and essential oils. In Annual Rept. on the progress of applied chemistry 10: 543-570 (1925); 148 footnotes. 11: 589-614 (1926); 129 footnotes. 12: 626-657 (1927); 162 footnotes. 13: 612-639 (1928); 110 footnotes.

TIFFENEAU, M. Les produits pharmaceutiques. In Dix ans d'efforts scientifiques et industriels, p. 607-622 (Paris, Chimie et industrie). Bibl. footnotes.

WAESER, ERNST. Synthese der organischen Arzneimittel. Stuttgart, Enke, 1928. 227 p. Patents and literature at end of sections.

WEBSTER, RALPH W. Potassium and tartrates. With digest and bibliography of the literature by W. A. Brennan. Chicago, Commonwealth Press, 1927. 168 p.

WICKEL, PAUL B. Die Geschichte des Kupfers in der Medizin. Inaug.-diss., Tierärztl. Hochschule, Berlin, 1925. 70 p. Bibl., p. 63-69.

WINKELBLECH, LIDE, and KREMERS, EDWARD. Book literature on new remedies. J. Am. Pharm. Assoc. 18: 354-356 (1929). Chronological, 1821-1921.

See also DRUGS.

PHARMACOGNOSY

KRAEMER, HENRY. Kraemer's scientific and applied pharmacognosy. 3rd ed. N. Y., Wiley, 1928. 893 p. Contains bibls.

WASICKY, RICH. Pharmakognostischer Bericht über das Jahr 1927. Arch. Pharm. 266: 416-430 (1928). 118 footnotes.

YOUNGKEN, HEBER W. A textbook of pharmacognosy. 2nd ed. Philadelphia, Blakiston's, 1926. 700 p. Bibl., p. 655-656.

PHARMACOLOGY

CUSHNY, ARTHUR R. A text-book of pharmacology and therapeutics; or, The action of drugs in health and disease. 9th ed. Philadelphia, Lea & Febiger, 1928. 743 p. Contains bibls.

ENGEL, KURT. Pharmakologische Grundlagen der Phosphorthherapie. Klin. Wochschr. 3: 1775 (1924). 24 references.

HANDOVSKY, HANS. The significance of colloid chemistry for pharmacology and therapeutics. In Alexander, Colloid chemistry II: 935-956 (1928). 86 footnotes.

JENSEN, HERMAN H. An experimental study of certain benzyl compounds with especial attention to the importance of substitution in the benzyl nucleus and the significance of the side chains. J. Pharmacol. Exptl. Therap. 36: 167-169 (1925).

MEYER, HANS S., and GOTTLIEB, R. Experimental pharmacology as a basis for therapeutics; a text-book for students and physicians. Philadelphia, Lippincott, 1926. 656 p. Contains references.

OSWALD, ADOLF. Chemische Konstitution und pharmakologische Wirkung, ihre Beziehungen zu Einander bei den Kohlenstoffverbindungen. Eine Pharmakologie der Kohlenstoffverbindungen bekannter Konstitution. Berlin, Borntraeger, 1924. 892 p. Bibl. footnotes.

SOLLMANN, TORALD H. A manual of pharmacology and its applications to therapeutics and toxicology. 3rd ed., Philadelphia, Saunders, 1926. 1184 p. Bibl., p. 1069-1164.

SOLLMAN, TORALD H., and HANZLIK, PAUL J. An introduction to experimental pharmacology. Philadelphia, Saunders, 1928. 321 p. Bibl., p. 305-306.

PHARMACY

ARNY, HENRY V. Principles of pharmacy. 3rd ed. Philadelphia, Saunders, 1926. 1078 p. Bibl., p. 15-16, and at end of most of the chapters.

HARSTE, W. Die medizinische Wirkung der *Capsella Bursa pastoris* sowie der auf ihr lebenden Parasiten *Cystopus candidus* und *Peronospora parasitica* mit besonderer Berücksichtigung des Entwicklungsganges der beiden Pilze. Arch. Pharm. 1928: 133-151. Bibl. by authors, p. 150-151. 26 references.

LAWALL, CHARLES H. Four thousand years of pharmacy; an outline history of pharmacy and the allied sciences. Philadelphia, Lippincott, 1927. 665 p. Bibl. p. 543-552.

PHENANTHRIDINES*

HOLLINS, C. Phenanthridines. In Synthesis of nitrogen ring compounds, 1924, p. 382-393. Patents and bibl. footnotes.

PHENOLS

GIBBS, H. D. Phenol tests. I. A classification of the tests and a review of the literature. *Chem. Reviews* 3: 308-319 (1926). 250 references, covering 100 tests.

GIBBS, H. D. Phenol tests. II. Nitrous acid tests. The Millon and similar tests. Spectrophotometric investigations. *J. Biol. Chem.* 71: 458-459 (1927). 31 references.

GIBBS, H. D. Phenol tests. III. The indophenol test. *J. Biol. Chem.* 72: 663-664 (1927). 16 references.

MEIGHAN, MERL H. An investigation of the caustic soda process of extracting low-temperature phenols. Thesis, Columbia Univ., 1925. 29 p. Contains bibls.

See also WATER: ANALYSIS.

PHENYLETHYL ALCOHOL*

LEONARD, CLIFFORD S. Synthesis of phenylethyl alcohol. *J. Am. Chem. Soc.* 47: 1774-1779 (1925). Bibl. footnotes; bibl., p. 1776.

PHOSGENE

DYSON, G. MALCOLM. Phosgene. *Chem. Reviews* 4: 109-165 (1927). 189 footnotes.

PHOSPHATASE*

NEUBERG, CARL, and SIMON, ERNST. Phosphatasen. In *Abderhalden, Handb. biol. Arbeitsm.* IV, pt. 1: 615-624 (1925). Bibl. footnotes.

See also ENZYMES.

PHOSPHATES

JACOB, K. D. Phosphate rock. *Mineral Ind.* 36: 457-460 (1927). 70 references.

KIRKHAM, VIRGIL R. D. Phosphate deposits of Idaho and their relation to the world supply. *Idaho, Bur. Mines and Geol., Reprint no. 1.* 28 p.

MANSFIELD, GEORGE R. Phosphate rock. *U. S. Geol. Surv., Mineral Resources*, 1923, II: 258-261, 270-273; 70 references. 1924, II: 98-99, 109-112; 80 references.

SCHUCHT, LUDWIG. Die Fabrikation des Superphosphates mit Berücksichtigung der anderen gebräuchlichen Düngemittel nach dem Handbuch von Ludwig Schucht in 4. verm. und verb. Aufl. Braunschweig, Vieweg, 1926. 372 p. Bibl. footnotes.

WAGGAMAN, W. H. Phosphate rock. *Mineral Ind.* 33: 572-573 (1924). 20 references.

WAGGAMAN, W. H., and EASTERWOOD, HENRY W. Phosphoric acid, phosphates and phosphatic fertilizers. N. Y., Chem. Cat. Co., 1927. 370 p. Bibl. footnotes. U. S. patents, p. 323-366.

WEIGEL, W. M., and STODDARD, B. H. Phosphate rock. *Mineral Resources of the U. S.* 1925, pt. II: 164.

See also FERTILIZERS.

PHOSPHINE

MELLOR, J. W. Hydrogen tritaphosphide, or phosphorus trihydride, or phosphine. In *his Inorg. theor. chem.* 8: 819-822 (1928).

PHOSPHORESCENCE

PHIPSON, THOMAS L. Phosphorescence, or the emission of light by minerals, plants and animals. Reeves, 1870. Bibl., p. 203-209.

See also FLUORESCENCE; LUMINESCENCE; PHOTOCHEMISTRY (Allen).

PHOSPHORIC ACID

WAGGAMAN, WM. H., and EASTERWOOD, H. W. Phosphoric acid, phosphates, and phosphatic fertilizers. N. Y., Chem. Cat. Co., 1927. 370 p. Bibl. footnotes. Bibl. of U. S. patents, p. 323-366.

See also FERTILIZERS.

PHOSPHORIC ACID: Analytical.

GUYON, ROBERT F. LE. Semi-micro-méthode pour le titrage de l'acide ortho phosphorique. Application aux urines cathétérisées. *Bull. soc. chim. biol.* 9: 74-75 (1927). 23 references.

WRANGELL, MARGARETE V. Kolorimetrische Methode zur schnellen Bestimmung von Phosphorsäure in sehr verdünnten Lösungen. *Landw. Jahrb.* 63: 676 (1926).

PHOSPHOROUS ACID

MELLOR, J. W. Phosphorous acid. In *his Inorg. theor. chem.* 8: 909-911, 920-921 (1928).

PHOSPHORUS

MELLOR, J. W. Phosphorus. In *his Inorg. theor. chem.* 8: 728-1080 (1928). Bibl. through text.

SCHLEEDE, ARTHUR. Ueber den chemischen Bau des Phosphors. *Naturwissenschaften* 14: 586-593 (1926). Bibl. footnotes.

PHOSPHORUS BROMIDES

MELLOR, J. W. The phosphorus bromides and oxybromides. In *his Inorg. theor. chem.* 8: 1037 (1928). About 100 references.

PHOSPHORUS CHLORIDES

MELLOR, J. W. The oxychlorides of phosphorus. In *his Inorg. theor. chem.* 8: 1028-1030 (1928).

MELLOR, J. W. Phosphorus dichloride and trichloride. In *his Inorg. theor. chem.* 8: 1007-1009 (1928).

MELLOR, J. W. Phosphorus pentachloride or phosphoric chloride. In *his Inorg. theor. chem.* 8: 1017-1019 (1928).

PHOSPHORUS FLUORIDES

MELLOR, J. W. Phosphorus fluorides. *In his* Inorg. theor. chem. 8: 998 (1928). About 50 references.

PHOSPHORUS IODIDES

MELLOR, J. W. The phosphorus iodides and oxyiodides. *In his* Inorg. theor. chem. 8: 1041-1042 (1928). About 100 references.

PHOSPHORUS OXIDES

MELLOR, J. W. The lower oxides of phosphorus. *In his* Inorg. theor. chem. 8: 870 (1928). About 50 references.

MELLOR, J. W. Phosphorus pentoxide, or phosphoric oxide. *In his* Inorg. theor. chem. 8: 946-947 (1928).

MELLOR, J. W. Phosphorus trioxide, or phosphorus oxide. *In his* Inorg. theor. chem. 8: 898-899 (1928). About 75 references.

PHOSPHORUS SULFIDES

MELLOR, J. W. The phosphorus sulphides. *In his* Inorg. theor. chem. 8: 1057-1058 (1928). About 125 references.

MELLOR, J. W. Thiophosphoryl halides, and phosphorus thiohalides. *In his* Inorg. theor. chem. 8: 1080 (1928). About 100 references.

PHOTOCHEMISTRY

ALLEN, H. STANLEY. Photo-electricity, the liberation of electrons by light with chapters on fluorescence and phosphorescence, photochemical actions and photography. London, Longmans, 1925. 320 p. Extensive bibl.

ALLMAN, J. J. Das Einsteinsche photochemische Aequivalentgesetz. *Z. physik. Chem.* 120: 1-23 (1926). Bibl. footnotes.

BACHER, FRITZ. Chemische Reaktionen organischer Körper im ultravioletten Licht und im Licht der Sonne. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2: 1339-1968 (1928).

BANCROFT, WILDER D. The displacement of equilibrium by light. *J. Phys. Chem.* 32: 529-572 (1928). Bibl. footnotes.

BODENSTEIN, MAX. Der Mechanismus photochemischer Reaktionen. *Z. physik. Chem.* 120: 129-143 (1926). Bibl. footnotes.

BODENSTEIN, MAX. Photochemie. *Ergeb. exakt. Naturwissenschaften* 1: 226-227 (1922). 54 references

BÜCHI, PAUL F. Die Quantenempfindlichkeit der Uranyloxalatphotolyse. *Z. physik. Chem.* 111: 269-314 (1924). Bibl. footnotes.

FARADAY SOCIETY, LONDON. Photochemical reactions in liquids and gases; a general discussion held by

the Faraday Society, Oct., 1925. *Trans. Faraday Soc.* 21: 437-658 (1926).

FERBES, GEORGE S. Experimental technique for quantitative study of photochemical reactions. *J. Phys. Chem.* 32: 482-502 (1928). 235 footnotes.

HOUBEN, J. Belichten. *In* Houben-Weyl, *Meth. org. Chem.*, 3rd ed., II: 1164-1326 (1925). Bibl. footnotes.

KISTIAKOWSKY, G. B. Photochemical processes. N. Y., Chem. Cat. Co., 1928. 270 p. Several hundred bibl. footnotes. Bibl. on Temperature coefficient of photochemical reactions, p. 242-244.

DE LASZLE, HENRY G. Absorption coefficients. *J. Phys. Chem.* 32: 503-506 (1928). 27 footnotes.

MARSHALL, ABRAHAM L. The photochemical reaction between hydrogen and chlorine. *Trans. Am. Electrochem. Soc.* 49: 143-179 (1926). 71 footnotes.

MORTON, RICHARD A. Radiation in chemistry. London, Bailliere, Tindall and Cox, 1928. 284 p. Contains bibls.

NOYES, W. ALBERT, JR., and KASSEL, LOUIS S. A review of photochemistry. *Chem. Reviews* 3: 199-225 (1926). 91 footnotes.

Photochimie. *In* Tables annuelles V: 1140-1148 (1917-1922); VI: 1041-1057 (1923-1926).

PUCHER, G. W. Chemical changes produced by light energy. *Buffalo Gen. Hospital Bull.* 3: 76-82 (1925). 65 references.

SCHAUM, K. Photochemie und Photographie. Leipzig, Barth, 1908. 228 p. Bibl. footnotes.

SHEPPARD, S. E. Antagonism of radiations in photochemical and photographic reactions. *Chem. Reviews* 4: 351-353 (1927). 76 references.

TAYLOR, HUGH S. Quantum processes in photochemistry. *J. Phys. Chem.* 32: 527-528 (1928). 31 references.

TRAMM, HEINRICH. Ueber den Einfluss der Trocknung auf photochemische Reaktionen. *Z. physik. Chem.* 105: 356-401 (1923). Bibl. footnotes.

TURNER, LOUIS A. The excited systems formed by the absorption of light. *J. Phys. Chem.* 32: 515 (1928). 32 references.

WEIGERT, FRITZ. Optische Methoden der Chemie. Leipzig, Akad. Verlagsges., 1927. 632 p. About 1000 references.

WEIGERT, FRITZ. Zur Theorie der Strahlungsumformungen. II, Die photochemischen Chlorreaktionen. *Z. physik. Chem.* 106: 407-432 (1923). Bibl. footnotes.

PHOTOCHEMISTRY—Cont'd.

WIGAND, ALBERT. Die umkehrbare Lichtreaktion des Schwefels. *Z. physik. Chem.* 77:423-471 (1911). Bibl. footnotes.

See also PHOTOSYNTHESIS.

PHOTOGRAPHY

BANCROFT, WILDER D. The theory of photography. *Trans. Faraday Soc.* 19:243-255 (1923). Bibl. footnotes.

BULLOCK, EDMUND R. Chemical reactions of the photographic latent image. N. Y., Van Nostrand, 1927. Bibl., p. 153-158.

CLERC, LOUIS P. Les reproductions photomécaniques; monochromes, photogravure, similgravure, phototypie, héliogravure, etc. 1925. Bibl., p. 383-387.

DORGELO, H. B. Die photographische Spektralphotometrie. *Physik. Z.* 25:793-794 (1925). 99 references.

EASTMAN KODAK Co. Aerial haze and its effect on photography from the air. N. Y., Van Nostrand, 1923. 84 p.

EDER, J. M. Ueber Sensibilisatoren bei photochemischen, photographischen und biologischen Prozessen. *Jahrb. Radioakt. Elektronik* 22:71-92 (1922). Bibl. footnotes.

JONES, LLOYD A. Recent progress in the sensitometry of photographic materials. *Trans. Faraday Soc.* 19:367-378 (1923). Bibl. footnotes.

JUDGE, ARTHUR W. Stereoscopic photography, its application to science, industry and education. London, Chapman & Hall, 1926. 236 p. Bibl., p. 236.

KEENAN, GEORGE L. Substances which effect photographic plates in the dark. *Chem. Reviews* 3:108-111 (1926). 62 references.

LÜPPO-CRAMER, —. Das Silber in der Photographie. *Z. wiss. Phot.* 23:302 (1925). 23 references.

LÜPPO-CRAMER, —. Kolloidchemie und Photographie. 2nd ed. Dresden, Steinkopff, 1921. 154 p. Bibl. footnotes.

MEIDINGER, WALTER. Fortschritte der Photographie. *Z. angew. Chem.* 39:629-633 (1926). 28 references.

MONPILLARD, P. Macrophotographie et microphotographie. Paris, Doin, 1926. 671 p. Bibl., p. 656-666.

NEBLETTE, CARROLL B. Photography, its principles and practice; a manual of the theory and practice of photography, designed for use in colleges, technical institutions and by the advanced student of the science. N. Y., Van Nostrand, 1927. 644 p. Bibl., p. 589-630.

Photographie. In *Tables annuelles* V: 1149-1177 (1917-1923); VI: 1056-1091 (1923-1926).

ROSS, F. E. The physics of the developed photographic image. N. Y., Van Nostrand, 1924. 217 p.

SCHAUM, K. Photochemie und Photographie. Leipzig, Barth, 1908. 228 p. Bibl. footnotes.

SHEPPARD, S. E., and JONES, L. A. Properties of photographic materials. *International critical tables* V:446 (1929). 44 references.

SHEPPARD, S. E., TRIVELLI, A. P. H., and LOVELAND, R. P. The formation of the latent image. *J. Franklin Inst.* 200:51-86 (1925). 67 footnotes.

SHEPPARD, S. E., TRIVELLI, A. P. H., and WIGHTMAN, E. P. Exposure theories. *Trans. Faraday Soc.* 19:296-308 (1923). Bibl. footnotes.

SHEPPARD, S. E., WIGHTMAN, E. P., and TRIVELLI, A. P. H. Studies in photographic sensitivity. IV. Effect of oxidizers on the sensitivity and on the latent image. *J. Franklin Inst.* 198:507-515 (1924). 30 footnotes.

SILBERMANN, H. Fortschritte auf dem Gebiete der photo- und chemigraphischen Reproduktionsverfahren, 1877-1906. Leipzig, Degener. 2 vols. German patents.

SNODGRASS, LLOYD I. The science and practice of photographic printing. 2nd ed. Rochester, N. Y., 1925. 310 p. Bibl., p. 299-302.

SOCIETY OF CHEMICAL INDUSTRY. Photographic materials and processes. In *Reports of the progress of applied chemistry* 10:571-621 (1925); 329 footnotes. 11:615-651 (1926); 263 footnotes. 12:658-684 (1927); 217 footnotes. 13:640-665 (1928); 236 footnotes.

STENGER, ERICH. Auskopierpapiere ohne Edelmetall-Tönung. Halle, Knapp, 1925. 90 p. Bibl. footnotes.

SYEIGMANN, A. Beiträge zur Kenntnis photographisch-kolloidchemischer Kristallisations-Vorgänge. *Kolloid Z.* 29:145-156 (1921). 107 footnotes.

VIDAL, LÉON. Traité pratique de photolithographie. Photolithographie directe et par voie de transfert. Photozincographie. Photocollographie. Autographie. Photographie sur bois et sur métal à graver. Tours de main et formules diversés. Paris, Gauthier-Villars, 1893. 419 p. Bibl., p. 412-415.

WALL, E. J. The history of three-color photography. Boston, Am. Photographic Pub. Co., 1925. 747 p. Each section followed by a comprehensive bibl. to literature and patents.

- WALL, E. J. Intensification and reduction, a critical résumé of all known methods with references to the original monographs. Boston, Am. Photographic Pub. Co., 1927. 40 p. 241 abstracts of original papers.
- WALL, E. J. Practical color photography. Boston, Am. Photographic Pub. Co., 1928. 280 p. Bibl., p. 272-274.
- WENTZEL, FRITZ. Die photographisch-chemische Industrie; die Erzeugung und Verarbeitung photographisch-chemischer Präparate. Dresden und Leipzig, Steinkopff, 1926. 363 p. Bibl., p. xiv-xv.
- WHEELER, OWEN. Colour photography. London, Pitman, 1928. 138 p. Bibl., p. 134-135.
- WIGHTMAN, E. P., and SHEPPARD, S. E. The methods of determining size-frequency distribution. *J. Phys. Chem.* 25: 561-594 (1921). Bibl. footnotes.
- WIGHTMAN, E. P., TRIVELLI, A. P. H., and SHEPPARD, S. E. Structure of the photographic emulsion. *Trans. Faraday Soc.* 19: 270-279 (1923). Bibl. footnotes.
- WRIGHT, GEORGE B. Three color separation photography. A manual of simplified practice. South Norwalk, Conn., Wright, 1927. 45 p. Bibl., p. 44-45.
- ZAEFERNICK, HANS. Der Pigmentdruck. Halle, Knapp, 1923. 80 p. Bibl., p. iii.
- See also PAPER (Rossman); PHOTOCHEMISTRY (Allen).
- PHOTOMETRY**
- WALSH, JOHN W. T. Photometry. N. Y., Van Nostrand, 1926. 505 p. Bibl. at end of each chapter.
- PHOTOMICROGRAPHY***
- BARNARD, JOSEPH E., and WELCH, FRANK V. Practical photo-micrography. 2nd ed. N. Y., Longmans, 1925. 316 p. Bibl., p. 305-306.
- EASTMAN KODAK Co. Photomicrography; an introduction to photography with the microscope. 9th ed. Rochester, N. Y., Eastman Kodak Co., 1927. 48 p. Bibl., p. 47.
- PHOTOSYNTHESIS**
- BLUMBERGER, J. S. PETRUS. Theorien over de Koolzuurassimilatie. *Chem. Weekblad* 22: 425-436 (1925). 69 references.
- HOLLULA, JOSEF. Die neueren Anschauungen über die Dynamik und Energetik der Kohlensäureassimilation. *Sammlung chem. chem.-tech. Vorträge* 28: 409-476 (1926). Bibl. footnotes.
- NIGHTINGALE, G. T. Chemical composition of plants in relation to photo-periodic changes. *Wis. Agr. Expt. Sta., Bull.* 74: 64-68 (1927).
- STANESCU, P. P. [Quantitative variations in the products of photosynthesis in the leaves of green plants in one day (24 hours).] *Ann. sci. univ. Jassy* 14: 383-510 (1927). 86 references.
- STILES, WALTER. Photosynthesis; the assimilation of carbon by green plants. London, N. Y., Longmans, 1925. 268 p. Bibl., p. 212-251. 870 references.
- See also PHOTOCHEMISTRY.
- PHOTOTHERAPY***
- FERGUSON, JOHN B. The quartz mercury vapour lamp, its possibilities and uses in public health and general practice. London, Lewis, 1926. 105 p. Bibl., p. 100-101.
- GUILLAUME, ANDRÉ C. Les radiations lumineuses en physiologie et en thérapeutique; de l'infra-rouge à l'ultra-violet. Paris, Masson, 1927. 515 p. Bibl., p. 493-508.
- HAUSMANN, WALTHER, and VOLK, R. Handbuch der Lichttherapie. Berlin, Springer, 1927. 444 p. Bibl. at end of most of the sections.
- LAURENS, HENRY. Some of the physiological effects of radiant energy. *J. Optical Soc. Am.* 18: 251-252 (1929). 27 references.
- RUSSELL, ELEANOR H., and RUSSELL, W. KERR. Ultra-violet radiation and actinotherapy. 2nd ed. Edinburgh, Livingstone, 1927. 429 p. Bibl., p. 415-418.
- SAIDMAN, JEAN. Les rayons ultra-violet et associés en thérapeutique. Paris, Doin, 1925. 580 p. Bibl., p. 564-577.
- PHOTOTROPY.** See PHOTOCHEMISTRY (Houben).
- PHTHALEINS***
- COHEN, BARNETT. Synthesis and indicator properties of some new sulfonphthaleins. Reprint no. 1131 from the Public Health Repts., 41: 3051-3074 (1926). Bibl., p. 23-24.
- PHYSICAL CHEMISTRY**
- BENRATH, ALFRED. Physikalische Chemie. Dresden und Leipzig, Steinkopff, 1923-1925. 2 v. Bibl. footnotes.
- GETMAN, FREDERICK H. Outlines of theoretical chemistry. N. Y., Wiley, 1927. 728 p. Contains bibls.
- HEDGES, ERNEST S., and MYERS, J. E. The problem of physico-chemical periodicity. N. Y., Longmans, 1926. 95 p. Bibl., p. 87-93.
- VÈZES, PIERRE M. Leçons de chimie physique. Paris, Vuibert, 1927. 545 p. Bibl., p. 533-536.

PHYSIOLOGICAL CHEMISTRY

ABDERHALDEN, EMIL. *Lehrbuch der Physiologie in Vorlesungen*. Berlin, Wien, Urban & Schwarzenberg, 1925. Bibl. footnotes.

BAYLISS, WM. M. *Principles of general physiology*. 4th ed. London, Longmans, 1924. 882 p. Bibl., p. 741-846. Bibl. at end of each chapter.

FINKELSTEIN, M. H. A summary of the recent work on the biochemistry of the pneumococcus. *Sci. Progress* 21: 81-82 (1926). 43 references.

HAUROWITZ, FELIX. *Biochemie des Menschen und der Tiere seit 1914*. Dresden und Leipzig, Steinkopff, 1925. 148 p. Bibl. at end of each chapter.

HÖBER, RUDOLPH. Colloidal state and physiological function. In Alexander, *Colloid chemistry II*: 619-628 (1928). 47 footnotes.

HÖBER, RUDOLPH. *Physikalische Chemie der Zelle und der Gewebe*. 6. Aufl. Leipzig, Engelmann, 1926. 955 p. Bibl. footnotes.

MATHEWS, ALBERT P. *Physiological chemistry; a text-book and manual for students*. 4th ed. N. Y., Wood, 1925. 1233 p. Bibl. at end of some of the chapters.

PARSONS, THOMAS R. *Fundamentals of biochemistry in relation to human physiology*. 3rd ed., rev. Cambridge, Eng., Heffer, 1927. 308 p. Bibl. at end of each chapter.

ROGERS, CHARLES G. *Textbook of comparative physiology*. N. Y., McGraw-Hill, 1927. 635 p. Bibl., p. 579-608.

THIERFELDER, HANS. *Handbuch der physiologisch- und pathologisch-chemischen Analyse, für Aerzte und Studierende*. 9. Aufl. Berlin, Springer, 1924. 1004 p. Bibl. footnotes.

VAN SLYKE, DONALD D. *Factors affecting the distribution of electrolytes, water, and gases in the animal body*. Philadelphia, Lippincott, 1926. 62 p. Bibl., p. 60-62.

See also BIOCHEMISTRY.

PHYTIN

NEEDHAM, JOSEPH. Die physiologische Bedeutung der Cyclosen. *Ergeb. Physiol.* 25:1-45 (1926). Bibl., p. 1-5.

PICRIC ACID

ESCALES, R. *Die Explosivstoffe*. Vol. 6. Nitrosprengstoffe. Leipzig, Veit, 1915. 448 p. Bibl., p. 439; patents, p. 440-441.

MARSHALL, A. The history of picric acid. *Chemistry and Industry* 44:4-5 (1925). 21 footnotes.

See also EXPLOSIVES.

PIGMENTS

LANGTON, HAROLD MCK. *Blacks and pitches*. London, Benn, 1925. 179 p. Bibl. at end of each chapter.

See also PAINTS.

PIGMENTS: Animal.

PALLADIN, W. Ueber die Bedeutung der Atmungspigmente in den Oxydationsprozessen der Pflanzen und Tiere. *Z. Gärungsphysiol.* 1:91-105 (1912). Bibl. footnotes.

VERNE, JEAN. Les pigments dans l'organisme animal; chimie-morphologie—physiologie—éthologie. Paris, Doin, 1926. 608 p. Bibl., p. 547-589.

WAGNER, HANS. *Die Körperfarben*. Stuttgart, Wissenschaftliche Verlagsges. m. b. H., 1928. 516 p. Bibl. footnotes and at end of sections.

See also BLOOD; BILE; HEMOGLOBIN; MELANIN; ETC.

PIGMENTS: Plant.

DEUBER, C. G. Influence of mineral elements upon development of chloroplast pigments of the soy bean. *Bot. Gaz.* 82:151-153 (1926).

HUNTRESS, E. H. The chemistry of the red and blue pigments of fruits and flowers. *J. Chem. Education* 5: 1392-1398, 1615-1620 (1928); 6:52-58 (1929). 33 references.

KARRER, P. Sur les matières colorantes des fleurs. *Bull. soc. chim.* 43:1041-1058 (1928). Bibl. footnotes.

MÖBIUS, MARTIN A. J. *Die Farbstoffe der Pflanzen*. Berlin, Borntraeger, 1927. 200 p. Bibl., p. 176-186.

See also ANTHOCYANS; CAROTIN; CHLOROPHYLL; ETC.

PIPERONAL. See COUMARIN.**PITUITARY**

GEILING, E. M. K. The pituitary body. *Physiol. Rev.* 6:116-123 (1926).

SULLIVAN, MICHAEL X., and SMITH, M. I. Loosely bound sulphur in pituitary extracts. Reprint no. 1230 from the Public Health Repts., 43: 1334-1342 (1928). 9 p. Bibl., p. 8-9.

TRENDELENBURG, PAUL. *Pharmakologie und Physiologie des Hypophysenhinterlappens*. *Ergeb. Physiol.* 25:364-368 (1926). Bibl., p. 364-377.

PLANT CELLS*

KAHO, HUGO. Das Verhalten der Pflanzenzelle gegen Salze. *Ergeb. Biol.* 1:403-406 (1926). 75 references.

PFEIFFER, HANS. *Die pflanzlichen Trennungsgewebe*. Berlin, Borntraeger, 1928. 236 p. Bibl., p. 189-208.

SCARTH, GEORGE WM. The influence of external osmotic pressure and of disturbance of the cell surface on the permeability of *Spirogyra* for acid

dyes. The mechanism of the accumulation of dyes by living cells. McGill Univ. Publ., Botany, Nos. 42-43. 1926. Bibl., p. 213, 227-229.

SCHÜRHOFF, PAUL N. Die Zytologie der Blütenpflanzen. Stuttgart, Enke, 1926. 792 p. Bibl., p. 717-778.

PLANTS*

BOAS, FRIEDRICH. Die Pflanze als kolloides System. Freising-München, Datterer, 1928. 141 p. Bibl., p. 134-139.

DOLE, E. J. Studies on the effects of air temperature and relativity humidity on the transpiration of *Pinus strobus*. Vermont Agr. Sta., Bull. 238, 1924. 39 p. 34 references, p. 38-39.

DUSTMAN, ROBERT B. Inherent factors related to absorption of mineral elements by plants. Bot. Gaz. 79: 233-264 (1925). Bibl., p. 262-264, 50 references.

JOHNSON, HARLAN W. Relationships between hydrogen ion, hydroxyl ion and salt concentrations and the growth of seven soil molds. Agr. Expt. Sta., Iowa State College of Agr. and Mech. Arts, Res. Bull. no. 76, 1923. 38 p. Bibl., p. 343-344.

KORSTIAN, C. F. Density of cell sap in relation to environmental conditions in the Wasatch Mountains of Utah. J. Agr. Research 28: 845-907 (1924). Bibl., p. 900-907. 121 references.

LEUTHARDT, FRANZ. Puffer Kapazität und Pflanzensäfte. Kolloidchem. Beihefte 25: 67-68 (1927).

MURNEEK, ANDREW E. Effects of correlation between vegetative and reproductive functions in the tomato (*Lycopersicon esculentum* Mill). Plant Physiol. 1: 3-56 (1926). Bibl., p. 51-55.

NIGHTINGALE, GORDON T. The chemical composition of plants in relation to photoperiodic changes. Res. Bull. 74., Agr. Expt. Sta., Univ. of Wisconsin, 1927. 68 p. Bibl., p. 64-68.

POPP, H. W. Summary of literature on some phases of the effect of light on plant growth. Trans. Illum. Eng. Soc. 19: 992-994 (1925). 38 references.

ROBBINS, WILLIAM J. The isoelectric point for plant tissue and its importance in absorption and toxicity. Univ. of Missouri Studies; a quarterly of research, 1: 52-56.

TRIER, G. Chemie der Pflanzenstoffe. Berlin, Borntraeger, 1924. 605 p. Bibl. footnotes.

See also BOTANICAL CHEMISTRY; PHOTOSYNTHESIS.

PLANTS: Biochemistry. See BOTANICAL CHEMISTRY.

PLANTS: Chemicals, effect of

ARNDT, C. H. Growth of field corn as affected by iron and aluminum salts. Am. J. Bot. 9: 70-71 (1922). 46 references.

BRANNON, J. M. Influence of certain sugars on higher plants. Bot. Gaz. 75: 387-389 (1923). 28 references.

BUTKEVICH, V. V. Ueber die Faktoren, welche das Verhalten der Pflanzen gegen schwerlösliche Ca-Phosphate beeinflussen. Landw. Jahrb. 66: 991-992 (1927).

CURINI-GALLETTI, ALBIZZO. Il manganese e le piante. Staz. sper. agrar. Ital. 57: 178-193 (1924). 52 references.

EISENMENGER, WALTER S. Toxicity, additive effects and antagonism of salt solutions as indicated by growth of wheat roots. Thesis, Columbia, 1928. Bull. Torrey Bot. Club 55: 301-304 (1928).

GINSBURG, JOSEPH M., and SHIVE, JOHN W. The influence of calcium and nitrogen on the protein content of the soybean plant. Soil Science 22: 190-192 (1926). 54 references.

JACOB, JAN C. Anorganische beschädigungen bij *Pisum sativum* L. en *Phaseolus vulgaris* L. Proefschrift, Utrecht, 1927. 117 p. Bibl., p. 109-117.

LOMANITZ, S. The influence of sodium chloride upon alfalfa grown in solution cultures. Soil Science 18: 365-368 (1924). 89 references.

LUNDEGÅRDH, HENRIK G. Der Kreislauf der Kohlensäure in der Natur; ein Beitrag zur Pflanzenökologie und zur landwirtschaftlichen Düngungslehre. Jena, Fischer, 1924. 308 p. Bibl. footnotes.

MCGEORGE, WILLIAM T. The influence of aluminium, manganese and iron salts upon the growth of sugar cane, and their relation to the infertility of acid island soils. Expt. Sta. of the Hawaiian Sugar Planters' Assoc., Agr. and Chem. Ser. Bull. no. 49. 1925. 95 p. Bibl., p. 93-95.

MACGILLIVRAY, JOHN H. Effect of phosphorus on the composition of the tomato plant. J. Agr. Research 34: 126-127 (1927).

MCGUINN, ALBERT F. The action of dicyandiamid and guanil urea sulfate on plant growth. Soil Science 17: 498-500 (1924). 39 references.

METZGER, WILLIAM H. The relation of sodium nitrate and certain other nitrogen carriers to the development of

PLANTS: Chemicals, effect of—*Cont'd*
chlorosis in rice. J. Agr. Research 37: 601-602 (1928).

MORRIS, HARRY E., and SWINGLE, D. B. Injury to growing crops caused by the application of arsenical compounds to the soil. J. Agr. Research 34: 77-78 (1927).

NIKLAS, HANS, and GRANDEL, F. Ueber die Beziehungen zwischen Pflanzen- und Bodennitrat und deren zweckmässigste qualitative und quantitative Bestimmung nach zumeist eigenen Methoden. Freising-München, Datterer, 1927. 128 p. Bibl., p. 125-128.

PERIETZEANU, DÉMÈTRE J. Contribution à l'étude du sodium chez les végétaux. Thèse, Univ. Paris, 1926. 120 p. Bibl., p. 113-120.

SCHUSTER, GEO. L. Potash in relation to quality of crop. J. Am. Soc. Agronomy 19: 515-517 (1927). 38 references.

SOMMER, ANNA L. Studies concerning the essential nature of aluminum and silicon for plant growth. Univ. California Publs. in Agr. Sciences 5: 80-81 (1926).

UPPAL, BADRI N. Response of *Phytophthora* species to physical stimuli and certain organic compounds. J. Agr. Research 32: 1095-1097 (1926).

USPENSKIĬ, EVGENĬĬ E. Eisen als Faktor für die Verbreitung niederer Wasserpflanzen. Jena, Fischer, 1927. 104 p. Bibl., p. 96-101.

WIESSMANN, H. Ueber den Einfluss des Kaliums auf die Entwicklung der Pflanzen. Z. Pflanzenernähr. Düngung 2: 1-79 (1923). 170 footnotes.

See also FERTILIZERS.

PLANTS: Growth. *See* GROWTH: PLANTS.

PLANTS: Medicinal. *See* DRUGS; PHARMACOGNOSY.

PLANTS: Metabolism.*

GERICKE, S. Die Neubauersche Keimpflanzen-Methode zur Erkennung des Nährstoffbedarfes des Bodens. Eine Uebersicht über die bisherigen Arbeiten und die gewonnenen Erfahrungen mit der Neubauer-Methode 1923 bis Juni 1926. Landw. Jahrb. 64: 756-757 (1926).

MOLLIARD, MARIN. Nutrition de la plante. Formation des substances ternaires. Paris, Doin, 1921. 438 p. Bibl., p. 417-432.

MOLLIARD, MARIN. Nutrition de la plante. Utilization des substances ternaires. Paris, Doin, 1923. 306 p. Bibl., p. 289-302.

MOLLIARD, MARIN. Nutrition de la plante. Cycle de l'azote. Paris, Doin, 1925. 319 p. Bibl., p. 301-316.

MOLLIARD, MARIN. Nutrition de la plante. Échanges d'eau et de substances minérales. 2nd ed. Paris, Doin, 1927. 393 p. Bibl., p. 371-389.

STOKLASA, JULIUS, and PENKAVA, J. Ueber den Chemismus des Zuckerabbaues in der lebenden Pflanzenzelle und den Einfluss der Radioaktivität auf die anaerobe Atmung der Pflanzenorganismen. Chemie der Zelle und Gewebe 12: 362-433 (1926). Bibl. footnotes.

VAN DE SANDE-BAKHUYSEN, H. L., and ALSBERG, CARL L. The growth curve in annual plants. Physiol. Rev. 7: 183-187 (1927). 86 references.

YOCUM, LAWSON E. The translocation of the food materials of the wheat seedling. J. Agr. Research 31: 741-744 (1926).

See also TRANSPIRATION.

PLANTS: Respiration.*

BAILEY, CLYDE H. The respiration of shelled corn. Tech. Bull. 3, Univ. Minnesota, Agr. Expt. Sta. 1921. 44 p. Bibl., p. 40-42.

PLASMA

BIGWOOD, E. J., and WUILLOT, A. Contribution à l'étude du "sucre libre" du plasma sanguin. Bull. soc. chim. biol. 9: 882-883 (1927). 27 references.

HOWE, PAUL E. The function of the plasma proteins. Physiol. Rev. 5: 467-476 (1925). 156 references.

PICKERING, JOHN WM. The blood plasma in health and disease. London, Heinemann, 1928. 247 p. Bibl., p. 222-238. Bibl. on methods of estimating fibrinogen and fibrin, p. 239.

See also BLOOD.

PLASTERS. *See* CEMENT; GYPSUM; ETC.

PLASTIC FLOW. *See* METALS (Buck).

PLASTICITY

PIETERS, H. A. J. Plasticiteit. Chem. Weekblad 26: 18-24 (1929). Bibl. footnotes.

SLEGEL, PAUL J. Bibliography of plasticity. Bull. Am. Ceram. Soc. 7: 130-136 (1928). Covers the literature from 1895 to date.

See also ENAMELS.

PLASTICS: Synthetic.

ALADIN, —. Deutsche Patentliteratur über Verfahren zur Herstellung von Kondensationsprodukten aus Phenolen und Aldehyden. Kunststoffe 16: 193-197, 225-228, 250-251 (1926); 17: 9-16, 60-61 (1928). 242 patents.

ALADIN, —. Neuere Auslands Patentliteratur über Verfahren zur Herstellung von Kondensationsprodukten aus

- Phenolen und Aldehyden. Kunststoffe 17: 83-85, 106-108, 136-140, 157-160, 185-187, 208-211, 232-234 (1927). 334 patents.
- ALADIN, —. Zusammenstellung der Patentliteratur über Herstellung synthetischer Harze (mit Ausnahme der Kondensationsprodukte aus Phenolen und Aldehyden). Kunststoffe 17: 278-284 (1927); 18: 13-15, 34-37, 63-69, 90-93, 115-118 (1928). 363 patents.
- BAEKELAND, L. H., and BENDER, H. L. Phenol resins and resinoids. *Ind. Eng. Chem.* 17: 225-237 (1925); Kunststoffe 17: 156-157 (1927). 68 references.
- BOUVIER, LÉON. Les matières plastiques modernes. *Rev. gén. mat. plastique* 3: 281-285, 355-359, 481-487 (1925). Patent review.
- FISCHER, EMIL J. Kunstmassen aus Blut. Kunststoffe 17: 227-228 (1927). 30 patents.
- HALEN, S. Neuerungen auf dem Gebiete der Herstellung plastischer Massen. Kunststoffe 15: 19-23, 79-82, 134-135 (1925). Patent review.
- MANFRED, OTTO. Revue annuelle 1927 des progrès dans la fabrication des matières plastiques à base de caséine et l'albuminoïdes analogues. *Caoutchouc & Guttapercha* 25: 13978-13979 (1928). *Bibl. through text.*
- MEIER, O. Contribution à l'étude scientifique de la technologie chimique de la corne artificielle. *Caoutchouc et Guttapercha* 22: 12908-12913 (1925); 23: 995-996 (1926). *Bibl. through text.*
- OBRIST, J. Plastische Massen. *Kolloid-Z.* 45: 82-92 (1928). 65 footnotes.
- RIVISE, C. W. Pressureless molding of resinoids. *Plastics* 5: 9-11, 24 (1929). U. S. Patents.
- STEINITZER, F. Der Nachweis von Kondensationsprodukten aus Phenolen und Formaldehyd. Kunststoffe 5: 109-111 (1915). *Bibl. footnotes.*
See also CELLULOID; CORN; DYES (Doyle); RESINS.
- PLATINUM**
WAGNER, PERCY A. The preliminary report on the platinum deposits in the south-eastern part of the Rustenburg district, Transvaal. South Africa, *Geol. Survey, Mem. no. 24.* 1926. 37 p. *Bibl. at end.*
- PLATINUM SILICIDES.** See SILICIDES.
- POISONING: Industrial.** See BENZENE; CARBON MONOXIDE; INDUSTRIAL HAZARDS; LEAD.
- POISONS: Animal.**
BELFANTI, SERAFINO. I veleni degli animali nella biologia. *Biochim. terapia sperimentale* 14: 20-21 (1927). 26 references.
- CHEN, K. K., and JENSEN, H. Pharmacognostic study of ch'an su, the dried venom of the Chinese toad. *J. Am. Pharm. Assoc.* 18: 250-251 (1929). 44 references.
- CONTARDI, ANGELO. I veleni animali nella chimica. *Biochim. terapia sperimentale* 14: 63-64 (1927). 38 references.
- LÉVY, ROBERT. Contribution à l'étude des toxines chez les araignées. Paris, Masson, 1916. 239 p. *Bibl.*, p. 232-234.
- STANDENATH, FRIEDRICH. Beiträge zur Kenntniss der Giftigkeit von Organextrakten. *Fermentforschung* 9: 49 (1927). 51 references.
- STROHL, JOHANNES E. F. Die Giftproduktion bei den Tieren vom zoologisch-physiologischem Standpunkt. Zugleich ein Hinweis auf funktionelle Beziehungen zwischen Giften, Hormonen, Gerüchen. Leipzig, Thieme, 1926. 56 p. *Bibl.*, p. 48-56.
- POLARIZATION.** See OPTICAL ACTIVITY.
- POLLEN**
BRINK, R. A. The physiology of pollen. *Am. J. Botany* 11: 433-436 (1924). 85 references.
- ERDTMAN, G. (Literature on pollen statistics published before 1927). *Geol. Fören. Förh.* 49: 196-211 (1927). 265 references.
- VINSON, C. G. Some nitrogen constituents of corn pollen. *J. Agr. Research* 35: 275-278 (1927). *Bibl. of 50 references.*
- POLONIUM**
MARCKWALD, W. Polonium (Radium F). In Abegg, *Handb. anorg. Chem.*, 4, pt. 1, 1st half: 941 (1927). 39 references.
- POLYMERIZATION**
MEERWEIN, HANS. Polymerisation und Depolymerisation. In Houben-Weyl, *Meth. org. Chem.* 2nd ed., III: 1013-1052 (1923); 3rd ed., II: 593-639 (1925). *Bibl. footnotes.*
- POLYPEPTIDES.** See AMINO ACIDS.
- POLYTHIONIC ACIDS**
KURTENACHER, A. Literatur der Polythionsäuren. In Abegg, *Handb. anorg. Chem.*, 4, pt. 1, 1st half: 629-631 (1927). 132 references.
- PORCELAIN**
DIETZ, R. Porzellan. Halle, Knapp, 1907. 94 p. *Bibl.*, p. 90-91.

PORCELAIN—Cont'd

RIDDLE, FRANK H., and AUDLEY, JAMES A. Porcelain and whiteware. International critical tables II: 73, 81-82 (1927). 229 references.

See also CERAMICS; GLASS; POTTERY (Mellor).

PORPHYRINS *

FISCHER, HANS. Neuere Methoden der Isolierung und des Nachweis von Porphyrinen. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 11: 169-216 (1926). Bibl. footnotes.

FISCHER, HANS. Ueber Porphyrine und ihre Synthesen. Ber. 60: 2611-2651 (1927). 186 footnotes.

POTASH

FAURA Y SANS, MOSSÉN MARIÁN. Cuenca postasica de Cataluna y Pirineo Central. Madrid, Gráficas reunidas, s. a., 1926. 213 p. Bibl., p. 183-213.

HERMANN, C. Fortschritte in der Kali-industrie. Dresden, Steinkopff, 1927. 117 p. Bibl., p. 96, 115.

HOF, HANS. Fortschritte der Kali-industrie in den Jahren 1923-1925. Chem.-Ztg. 50: 797-799 (1926). 114 footnotes.

MANSFIELD, G. R., and BOARDMAN, L. Potash. U. S. Geol. Surv., Mineral Resources 1923, II: 199-204; 1924, II: 58-61. 115 and 90 references.

MERZ, ALBERT R., and ROSS, WM. H. The recovery of potash as a by-product in the blast furnace industry. U. S. Dept. Agr., Bull. 1226, 1924. 22 p. Bibl., p. 19-21.

RICE, GEORGE S., and DAVIS, JOHN A. Potash mining in Germany and France. U. S. Bur. Mines, Bull. 274. 1927. 92 p. Bibl., p. 87-89.

See also FERTILIZERS.

POTASSIUM: Physiological.

HAGEMANN, OSKAR, and OHL, EMIL. Ueber die biologische Bedeutung des Kaliums für den menschlichen und tierischen Organismus. Eine literarisch-kritische Studie. Landw. vers. Stat. 106: 125-284 (1927).

WEBSTER, RALPH W. Potassium and tartrates; a review of the literature on their physiological effects, with a digest and bibliography of the literature by W. A. Brennan. Chicago, Commonwealth Press, 1927. 168 p.

POTASSIUM ARSENATES. See ARSENATES.**POTASSIUM SILICATES. See SILICATES.****POTASSIUM SULFITE**

FOERSTER, F., BROSCHE, A., and NORBERG-SCHULZ, CHR. Ueber die

schwefligsäuren Salze des Natriums und des Kaliums. Z. physik. Chem. 110: 435-496 (1924). Bibl. footnotes.

POTTERY

MELLOR, J. W. Pottery. In his Inorg. theor. chem. 6: 518-519 (1925). About 100 references.

STEGER, WALTER. Wärmewirtschaft in der keramischen Industrie. Dresden und Leipzig, Steinkopff, 1927. 147 p. Bibl., p. 138-142.

See also CERAMICS; CLAYS; PORCELAIN; ETC.

PRECIPITATION *

ODEN, S. Om fällningar. Arkiv Kemi, Min. Geol. 9, no. 23 (1925). Bibl., p. 37-38. 27 references.

ODEN, S., and WERNER, D. Om fällningar. Arkiv Kemi, Min. Geol. 9, no. 32 (1926). Bibl., p. 38-39. 16 references.

PRECIPITINS

DOLD, HERMANN. Die Präzipitine und die Methoden der Präzipitation. In Abderhalden, Handb. biol. Arbeitsm. 13, pt. 2: 97-154 (1921). Bibl. footnotes.

See also IMMUNITY.

PRESERVES. See CANNING AND PRESERVING.**PRESSURE: Internal. See INTERNAL PRESSURE.****PROTAMINES**

KOSSEL, A. Protamines and histones. N. Y., Longmans, 1928. 107 p. Bibl., p. 97-104.

PROTEASES

OPPENHEIMER, CARL. Proteasen. In his Die Fermente, 803-889, 890-1024, 1025-1097, 1098-1139 (1926). 2481 footnotes.

See also ENZYMES.

PROTEIN THERAPY *

PETERSON, WM. F. Protein therapy and non-specific resistance. N. Y., Macmillan, 1922. 314 p. Bibl., p. 257-307.

PROTEINS

ARNOLD, O., and HAFNER, E. A. Ueber die Refraktion der Serumweißkörper und die Individualität von Albumin und Globulin. Biochem. Z. 167: 440-473 (1926). 137 references.

BALDWIN, IRA L., FRED, E. B., and HASTINGS, E. G. Grouping of legumes according to biological reactions of their seed proteins. Bot. Gaz. 83: 241-243 (1926).

BLANCHETIÈRE, A. L'évolution de nos connaissances sur la structure chimique des matières protéiques. Bull. soc. chim. biol. 7: 318-330 (1925). 388 references.

- CHAPMAN, L. M., GREENBURG, DAVID M., and SCHMIDT, CARL L. A. Studies on the nature of the combination between certain acid dyes and proteins. *J. Biol. Chem.* 72: 728-729 (1927). 41 references.
- COHN, EDWIN J. The physical chemistry of the proteins. *Physiol. Rev.* 5: 428-437 (1925). 366 references.
- COHN, EDWIN J., HENDRY, JESSIE L., and PRENTISS, ADELA M. The molecular weights of the proteins. 1. The minimal molecular weights of certain proteins. *J. Biol. Chem.* 63: 765-766 (1925). 73 references.
- FISCHER, EMIL. Untersuchungen über Aminosäuren, Polypeptide und Proteine. 2 v. 1906-1923. Berlin, Springer. Bibl. footnotes.
- FÜRTH, OTTO. Ueber die Ermittlung des Gehaltes an cyklichen Komplexen im Eiweissmolekül. *Ergeb. Physiol.* 24: 52 (1925). 42 references.
- GORTNER, R. A., HOFFMAN, W. F., and SINCLAIR, W. B. Physico-chemical studies on proteins. III. Proteins and the lyotropic series. *Colloid symposium monograph* 5: 179-198 (1928). 43 footnote references.
- HITCHCOCK, DAVID I. Eiweisskörper und Donnan-Gleichgewicht. *Ergeb. Physiol.* 23, 1: 274-275 (1924). 69 references.
- JONES, D. BREESE, GERSDORFF, C. E. F., and MÖLLER, O. The tryptophane and cystine content of various proteins. *J. Biol. Chem.* 62: 194-195 (1924). 49 references.
- KESTNER, O. Chemie der Eiweisskörper. 4th ed. Braunschweig, Vieweg, 1925. 422 p. Bibl. footnotes.
- KLARMANN, EMIL. Recent advances in the determination of the structure of proteins. *Chem. Reviews* 4: 103-107 (1927). 126 references.
- KOMM, ERNST. Eiweissbildung bei Tier und Pflanze. *Naturw. u. Landw.*, no. 5. 62 p. Bibl. of 75 references, p. 60-62.
- LARKIN, JULITTA, and WRIGHT, PAULINE. A study of hydration in lipid-protein systems. Thesis, Catholic Univ. of America, 1927. 47 p. Bibl., p. 44-46.
- LLOYD, DOROTHY J. Biological functions of the proteins. *Biol. Rev.* 3: 178 (1928). 50 references.
- LLOYD, DOROTHY J. Chemistry of the proteins and its economic applications. London, Churchill, 1926. 279 p. Bibl. at end of each chapter.
- MARTENS, RENÉ. Considérations sur le dosage séparé des acides aminés et des polypeptides dans les produits de digestion des protéines. *Bull. soc. chim. biol.* 9: 480-482 (1927). 20 references.
- MUENSCHER, W. C. Protein synthesis in chlorella. *Bot. Gaz.* 75: 265-267 (1923). 29 references.
- ROBERTSON, T. BRAILSFORD. Combination of proteins with acids and bases, with some observations on the origin of viscosity in protein solutions. *In* Alexander, *Colloid chemistry* II: 297-299 (1928). 145 references.
- SCOTT, IRI THORPE. Some protein analogies of the mycelium of *Fusarium lycopersici*. *Missouri Agr. Expt. Sta., Res. Bull.* 92. 1926. 44 p. Bibl., p. 42-44.
- SPIGEL-ADOLF, MONA. Physico-chemical investigations on the heat-denaturation of proteins. *In* Alexander, *Colloid chemistry* II: 303-326 (1928). 44 footnotes.
- VICKERY, H. B. Recent advances in protein chemistry. *Ind. Eng. Chem.* 16: 1030 (1924). 25 references.
- VICKERY, H. B., and OSBORNE, THOMAS B. Review of the hypotheses of the structure of proteins. *Physiol. Revs.* 8: 441-446 (1928). 192 references.
- See also AMINO ACIDS.
- PROTOPLASM**
- HEILBRUNN, L. V. Viscosity of protoplasm. *Quart. Rev. Biol.* 2: 246-248 (1927). 63 references.
- NEEDHAM, JOSEPH, and NEEDHAM, DOROTHY M. The oxidation-reduction potential of protoplasm. *Protoplasma* 1: 292-293 (1926). 88 references.
- SEIFRIZ, WILLIAM. The physical properties of protoplasm. *In* Alexander, *Colloid chemistry* II: 447-450 (1928). 246 references.
- PROTOTROPY ***
- LOWRY, T. M. Static and dynamic isomerism in prototropic compounds. *Chem. Reviews* 4: 252-253 (1927). 27 references.
- PTOMAINES.** See POISONS: ANIMAL.
- PUMICE ***
- BARBOUR, E. H. Nebraska pumice. *Neb. Geol. Surv.* 4, pt. 27: 357-401 (1913). 22 references, p. 400-401.
- ROWE, JESSE P. Some volcanic ash beds of Montana. *Univ. Montana, (Geol. Ser. 1) Bull.* no. 17. 1903. 32 p. Bibl., p. 29.
- PURINES**
- WINTERSTEIN, E. Isolierung von Purinbasen oder Alloxurkörper aus Pflanzen. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 8: 101-119 (1922). Bibl. footnotes.

PUTREFACTION

WOOD, J. T. Bacteriology of putrefaction. *J. Soc. Chem. Ind.* 25: 109-112 (1906). 21 references.

PYRIDINE

HOLLINS, C. Pyridine. *In his* Synthesis of nitrogen ring compounds, 1924, p. 182-242. Patents and bibl. footnotes.

PYRITES *

FOSLIE, STEINAR. Norges svovelkisforekomster. Oslo, Aschehoug, 1926. 122 p. Bibl. footnotes.

PYROGENESIS

DAY, R. B. A handbook of the petroleum industry. Vol. 2. 1922. Selected list of patents on cracking petroleum, p. 440-444.

PYROLYSIS

HURD, C. D. Pyrolysis of carbon compounds. N. Y., Chem. Cat. Co., 1929. 807 p. Several thousand footnotes.

PYROPHOSPHORIC ACID

MELLOR, J. W. Pyrophosphoric acid. *In his* Inorg. theor. chem. 8: 976-977 (1928). About 100 references.

PYROSOLS *

LORENZ, RICHARD. Pyrosols. *In* Alexander, Colloid chemistry I: 704-706 (1926). 115 references.

PYROXEMES. See MAGNESIUM SILICATES.**PYRROLES**

HOLLINS, C. Pyrroles. *In his* Synthesis of nitrogen ring compounds, 1924, p. 28-88. Patents and bibl. footnotes.

QUARTZ

HOLDEN, EDWARD F. The cause of color in smoky quartz and amethyst. *Am. Mineralogist* 10: 250-252 (1925). 58 references. Chronological.

See also SAND; SILICA AND SILICATES.

QUINAZOLINES

MCCOLM, EUGENE M. Researches in quinazolines; the preparation of some new analogs of cinchophen. Thesis, Columbia Univ., 1927. 29 p. Bibl., p. 27-28.

QUINOLINES

HOLLINS, C. Quinolines. *In his* Synthesis of nitrogen ring compounds, 1924, p. 243-331. Patents and bibl. footnotes.

QUINONES

HOUBEN, J. Die Chinone. *In* Houben-Weyl, Meth. org. Chem. 2nd ed., III: 514-630 (1923). Bibl. footnotes.

RACEMIZATION *

SCHIEBLER, HELMUTH. Racemisierung optisch aktiver Körper und Waldensche Umkehrung. *In* Houben-Weyl, Meth. org. Chem. 3rd ed., II: 1090-1119 (1925). Bibl. footnotes.

RADIUM AND RADIOACTIVITY

BURR, MAY S. Radium and its compounds. *In* Friend, Textbook inorg. chem. III, pt. I: 266-314 (1925). Bibl. footnotes.

CURIE, MAURICE. Le radium et les radio-éléments. Paris, Librairie J. B. Baillière et fils, 1925. 354 p. Bibl. references.

Emanation. *In* Gmelin's Handb. anorg. Chem. 8th ed., System-Nummer I: 193-222 (1926). Bibl. through text.

HEVESY, GEORGE, and PANETH, FRITZ. A manual of radioactivity. London, Oxford Univ. Press, 1926. 252 p. Bibl., p. viii-ix. References to the literature on radioactivity during the period 1916-1925, p. 230-244.

HOLMES, ARTHUR, and LAWSON, ROBERT W. Factors involved in the calculation of the ages of radioactive minerals. *Am. J. Sci.* (5) 13: 344 (1927). 44 references.

KOHLRAUSCH, K. W. F. Radioaktivität. Leipzig, Akad. Verlagsgesell. 1928. 885 p. Bibl. footnotes. Bibl., p. 857-876.

KOVARIK, A. F., and MCKEEHAN, L. W. Radioactivity. *Bull. Nat. Res. Council* no. 51. 1925. 203 p. Bibl., p. 173-203.

MEYER, STEFAN. Radioaktive Konstanten nach Stand von 1923. *Jahrb. Radioakt. Elektronik* 22: 334-335 (1922). 24 references.

MEYER, STEFAN, and SCHWEIDLER, EGON. Radioaktivität. Leipzig, Teubner, 1927. 721 p. Includes bibliographies.

NEUBERGER, M. C. Radioaktivität des Kaliums und Rubidiums im letzten Dezenium. *Samml. chem. chem.-tech. Vorträge* 26: 229-238 (1922). Bibl., p. 237-238.

PATTON, I. JOCELYN, and WALDBAUER, L. J. The radioactivity of the alkali metals. *Chem. Reviews* 3: 92-93 (1926). 29 references.

Radioactivité. *In* Tables annuelles V: 836-841 (1917-1922); VI: 804-812 (1923-1926).

SCHLUNDT, HERMAN. Distribution of radioactive materials in the atmosphere, the hydrosphere and the lithosphere. *International critical tables* I: 381 (1926). 139 references.

Wismut und radioaktive Isotope. *Gmelin's Handb. anorg. Chem.*, 8 Aufl., System-Nummer 19. 1927. 229 p.

See also ACTINIUM; POLONIUM; ETC.

RADIUM: Biological action.

CLARK, JOHN G., and NORRIS, CHARLES C. Radium in gynecology. Philadelphia

- phia, Lippincott, 1927. 315 p. Bibl. at end of each chapter.
- HERTWIG, PAULA. Partielle Keimschädigungen durch Radium und Röntgenstrahlen. 48 p. Bibl., p. 45-48.
- LAZARUS, PAUL. Handbuch der gesamten Strahlenheilkunde, Biologie, Pathologie und Therapie. 2. Aufl. des Handbuches der Radiobiologie und Therapie. München, Bergmann, 1927. Includes bibl.
- MAYER, EDGAR. Clinical application of sunlight and artificial radiation, including their physiological and experimental aspects with special reference to tuberculosis. Baltimore, Williams and Wilkins, 1926. 468 p. Bibl., p. 369-426.
- RADIUM CHEMICAL CO. Compendium of abstracts of papers on the therapeutic use of radium. 2nd ed. With a glossary of terms in radioactivity and radiumtherapy. Pittsburgh, Pa., Radium Chem. Co., 1925. 257 p.
- ZWAARDEMAKER, H. Ueber die Bedeutung der Radioaktivität für das tierische Leben. *Ergeb. Physiol.* 25: 535-573 (1926). Bibl., p. 535-536.
- RARE EARTHS**
- BOEHM, C. R. Das Vorkommen der seltenen Erden. *Chem. Ind.* 29: 320-332, 350-361 (1906). Bibl. classified by minerals, p. 326-331, 350-361.
- BOURION, F. Les terres rares. In *Dix ans d'efforts scientifiques et industriels*, p. 539-558 (Paris, Chimie et industrie). Bibl., p. 557-558. 86 references.
- PETERS, FRANZ. Die Elemente der seltenen Erden. In *Gmelin-Kraut, Handb. anorg. Chem.* VI, pt. 1: 334-647, 950-985 (1928). Bibl. through text.
- See also CRYSTALLOGRAPHY (Zambonini).
- RARE GASES**
- Edelgase. Helium. Neon. Argon, Krypton, Xenon, Emanation. In *Gmelin's Handb. anorg. Chem.* 8 Aufl., System-Nummer 1, 1926. 251 p. Helium, p. 36-98; Argon, p. 127-168; Neon, p. 99-126; Krypton, p. 169-181; Emanation, p. 193-222; Xenon, p. 181-192.
- LAAR, JOHANNES J. v. L'hydrogène et les gaz nobles. 1923. (Monographies chimiques theoriques et pratiques). Contains bibl. footnotes.
- MELLOR, J. W. The inert gases. In *his Inorg. theor. chem.* 7: 889-951 (1927). History, 75; Occurrence, 350; Preparation, 175; Physical properties, 1500; Chemical properties, 125; Atomic and molecular weights, 150 references.
- RABINOWITSCH, EUGEN. Die Edelgase. In *Abegg's Handb. anorg. Chem.* 4, sec. 3, pt. 1. Leipzig, Hirzel, 1928. 522 p. Bibl., p. 461-514. Classified. 1477 references.
- See also AIR: LIQUID.
- RAYON***
- AVRAM, MOIS H. The rayon industry. N. Y., Van Nostrand, 1927. 622 p. Patents, p. 443-500; Bibl., p. 553-575.
- BECKER, F. Die Kunstseide. Halle, Knapp, 1912. 368 p. List of patents, p. 357-360.
- BRANDENBERGER, H. Die Entwicklung der Acetatsidegewinnung. *Kunstseide* 11: 193-196 (1929). Patents through text.
- BRANDENBERGER, H. Die Färberei der Acetatside. *Kunstseide* 11: 98-106; 144-150; 183-186 (1929). 39 footnotes.
- DENHAM, WM. S. Properties of the silk fibre. *Trans. Faraday Soc.* 20: 259-268 (1925). Bibl. footnotes.
- DYES, W. A. Kupferseide. *Kunstseide* 11: 47-52 (1929). Patents references through text.
- DYES, W. A. Luft- und Hohlseide. *Kunstseide* 11: 5-11 (1929). Patent references through text.
- FAUST, O. Kunstseide. Dresden, Steinkopff, 1928. 165 p.
- FAUST, O. Kunstseide. In *Liesegang, Kolloidchem. Tech.*, 516-576 (1927). Bibl. footnotes.
- HERZOG, R. O. Zur Chemie und Physik der Kunstseide. *Z. angew. Chem.* 41: 531-536 (1928). 27 footnotes.
- HOTTENROTH, VALENTIN. Die Kunstseide. Leipzig, Hirzel, 1926. 492 p. Bibl., p. 467-472. English trans. N. Y., Pitman, 1928. 421 p. Bibl., p. 405-409.
- HUEBNER, J. Surveys of recent progress in the dyeing, printing and allied industries. I. Textile fibers. Artificial silk. *J. Soc. Dyers Colourists* 41: 387-401 (1925). 350 papers with brief abstracts.
- KARTASCHOFF, VALENTIN. Le phénomène de la teinture de la soie à l'acétate de cellulose. *Helv. Chim. Acta* 8: 928-942 (1925). Bibl. footnotes.
- MULLIN, CHAS. E. Acetate silk and its dyes. N. Y., Van Nostrand, 1927. 473 p. Bibl. at end of chapters.
- MULLIN, CHAS. E. Sizing and finishing acetate silk materials. *Textile Colorist* 49: 305-310 (1927). Patents through text.
- ROSSMAN, JOSEPH. Making rayon from cellulose acetate. *Rayon* 7, no. 10: 20-21, 37; no. 11: 16-18 (1928). Patent review.

RAYON—Cont'd

SÜVERN, KARL. Die künstliche Seide, ihre Herstellung und Verwendung, mit besonderer Berücksichtigung der Patent-Literatur. 5 Aufl. Berlin, Springer, 1926. 1108 p. Patents, p. 1095-1108.

WHEELER, E. The manufacture of artificial silk, with special reference to the viscose process. N. Y., Van Nostrand, 1928. 165 p. Bibl. at end of chapters.

REACTION LIMITS *

JORISSEN, W. P. Reaction limits, reaction regions and reaction spaces. Chem. Reviews 6: 42-43 (1929). 44 references.

REACTION VELOCITY

BRÖNSTED, J. N. Zur Theorie der chemischen Reaktionsgeschwindigkeit. Z. physik. Chem. 102: 169-207 (1922). Bibl. footnotes.

DANIELS, FARRINGTON. The radiation hypothesis of chemical reaction. Chem. Reviews 5: 65-66 (1928). 73 references.

RICE, FRANCIS O. Mechanism of homogeneous organic reactions from the physical-chemical standpoint. N. Y., Chem. Cat. Co., 1928. 217 p. Bibl. footnotes.

TASMAN, A. Velocity measurements on the opening of the lactone ring in derivatives of phthalide. Rev. trav. chim. 46: 653-698 (1927). 94 footnotes.

Vitesse de réaction. In Tables annuelles V: 1074-1139 (1917-1922); VI: 989-1040 (1923-1926).

See also CHEMICAL KINETICS; MUTAROTATION.

REDUCTION *

SCHMIDT, OTTO. Beiträge zur Kenntnis der katalytischen Hydrierung organischer Substanzen. Z. physik. Chem. 118: 193-239 (1925). Bibl. footnotes.

STOERMER, R. Reduktion. In Houben-Weyl, Meth. org. Chem., 3rd ed., II: 223-465 (1925). Bibl. footnotes.

See also HYDROGENATION.

REFRACTIVE INDEX

EISENLOHR, FRITZ. Der molekulare Brechungskoeffizient in der Reihe der Polymethylenverbindungen. Fortschritte Chem., Phys., physik. Chem. 18: no. 9. 48 p. 1925. Bibl. footnotes.

FULWEILER, W. H. Index of refraction (as an analytical constant). Proc. Am. Soc. Testing Materials 26, I: 527-530 (1926). 92 references.

HEYDWEILLER, ADOLF. Optische Untersuchungen an wässrigen Elektro-

lytlösungen. Physik. Z. 26: 555-556 (1925). 36 references.

Indices de refraction; Dispersion. In Tables annuelles V: 348-366 (1917-1923); VI: 245-256 (1923-1926).

JAFFÉ, G. Dispersion und Absorption. Leipzig, Akad. Verlagsges., 1928. 430 p. Bibl. footnotes.

WINCHELL, A. N. Dispersion of minerals. Am. Mineralogist 14: 125-149 (1929). References to 235 minerals.

REFRACTOMETERS

SHERWOOD, SIDNEY F. Use of the refractometer in the analysis of individual sugar beets. J. Agr. Research 36: 51-52 (1928).

REFRACTORIES

Bibliography of literature on refractories. J. Am. Ceram. Soc., Vol. 10, pt. 2 (1927). 166 p. 885 references with author and subject index.

BISCHOF, CARL. Die feuerfesten Tone und Rohstoffe. 4. Aufl. Leipzig, Barth, 1923. Contains numerous bibls.

BISCHOF, CARL. Les argiles réfractaires; matières premières et leur emploi dans l'industrie des produits réfractaires. 4th éd., revue et remaniée par K. Jacob et E. Weber, avec la collaboration du Laboratoire Chimique de l'industrie de l'argile et du Journal de l'industrie de l'argile; traduction par A. Schubert. 1926. Contains bibl. footnotes.

BLEININGER, A. V., and LIDDELL, DONALD M. Refractories. In Liddell, Non-ferrous metallurgy. I: 404-405 (1926). 98 references.

FERGUSON, ROBERT F. Review of the literature on laboratory slag tests for refractories. J. Am. Ceram. Soc. 11: 90-98 (1928). 53 footnotes.

GREEN, A. T. Firing properties of refractory fireclay products. Trans. Ceram. Soc. (Eng.) 26: 130-131 (1926-1927). 34 references.

LARSEN, BERNARD M., et al. Service conditions of refractories for open-hearth steel furnaces. Carnegie Inst. Tech., Mining Met. Investigations, Bull. 23. 1925. 126 p. Bibl., p. 120-122.

LITINSKY, L. Literatur über feuerfeste Materialien für Eisen- und Stahlwerke. Feuerfest 4: 30-32 (1928). 138 references.

LITINSKY, L. Schamotte und Silika, ihre Eigenschaften, Verwendung und Prüfung. Leipzig, Spamer, 1925. 286 p. Bibl., p. 256-276.

NORTON, F. H. Thermal conductivity of some refractories. J. Am. Ceram. Soc. 10: 49-52 (1927).

OBST, WALTER. (Preparation of refractory materials). *Feuerfest* 3: 129-130 (1927). Patent review.

Refractories. *Feuerfest* 3: 105-106, 121 (1927); 4: 98-100 (1928).

SOCIETY OF CHEMICAL INDUSTRY. Refractories, ceramics and cements. In *Reports of the progress of applied chemistry*, 10: 622-638 (1925); 65 footnotes. 11: 217-251 (1926); 158 footnotes. 12: 218-252 (1927); 170 footnotes. 13: 232-250 (1928); 70 footnotes.

STEGGER, W. Fortschritte auf feuerfestem Gebiet in England in den Jahren 1925-1926. *Feuerfest* 3: 173-181; 189-194 (1927). Bibl. footnotes.

WILKES, GORDON B. Refractory materials. *International critical tables* II: 86 (1927). 89 references.

See also CERAMICS; MAGNESIUM CARBONATE; SILICA.

REFRIGERATION

BERCAW, LOUISE O. Refrigeration and cold storage. Selected list of references covering 1915-1925. U. S. Dept. Agr. Library, Bibl. Contr. 10. 1925. 58 p.

ENGLER, C., and HOFER, H. v. "Refrigeration." In *Das Erdöl*, vol. 3, p. 597-614, 619-639 (1915). Bibl. footnotes.

JESSUP, R. S. Refrigerating brines. *International critical tables* II: 328 (1927). 41 references.

SCHIPPER, WILHELM.. Die Bedeutung der Kälteindustrie für die Lebensmittelversorgung der Grossstadt. München, Oldenbourg, 1925. 72 p. Bibl., p. 72.

RESINS

BARRY, T. HEDLEY, DRUMMOND, ALAN A., and MORRELL, R. S. The chemistry of the natural and synthetic resins. London, Benn, 1926. 196 p. Numerous citations to patent specifications.

DUPONT, G. The acid constituents of coniferous resins. *Bull. soc. chim.* 35: 1263-1270 (1924). A comprehensive review and bibl. 147 references.

FRYDLENDER, J. H. Glyptal und Kumaronharze. *Kunststoffe* 18: 158-160, 182-183 (1928). Patents through text.

SCHEIBER, J., and SÄNDIG, K. Die künstlichen Harze. Stuttgart, Wiss. Verlagsges., 1929. Contains list of patents.

VÈZES, M., and DUPONT, G. Résines et térébenthines, les industries dérivées. 1924. Bibl. footnotes.

WIESNER, J., and BAMBERGER, M. Harze. In *Wiesner, Die Rohstoffe*

des Pflanzenreiches I: 151-436 (1914). Bibl. footnotes.

WOLFF, HANS. Die natürlichen Harze. Stuttgart, Wiss. Verlagsges., 1928. 379 p. 454 footnotes.

WOLFF, H. Harze und Balsame. In *Wiesner, Die Rohstoffe des Pflanzenreiches*, 1101-1107 (1927). 364 references.

See also PLASTICS.

RESPIRATION

AMERSBACH, KARL, and BAYER, G. Atmung; Aufnahme und Abgabe gasförmiger Stoffe. Berlin, Springer, 1925. 552 p. Contains bibl.

GESELL, ROBERT. The chemical regulation of respiration. *Physiol. Rev.* 5: 588-595 (1925). 141 references.

RICHARDSON, HENRY B. The respiratory quotient. *Physiol. Rev.* 9: 115-125 (1929).

See also METABOLISM; PLANTS: METABOLISM.

RICE *

JODIDI, S. L. The nitrogen compounds of the rice kernel as compared with those of other cereals. *J. Agr. Research* 34: 324-325 (1927). 24 references.

RICKETS *

HOWLAND, JOHN. The etiology and pathogenesis of rickets. *Medicine* 2: 373-374 (1923). 75 references.

See also VITAMINS.

ROCKS

BERZ, KARL C. Ueber die Natur und Bildungsweise der marinen Eisensilikate insbesondere der chamositischen Substanzen. Ein Beitrag zur chemischen und mechanischen Sedimentation. *Fortschritte der Geologie und Palaeontologie* 3: 515-521 (1926).

CLOOS, HANS. Das Batholithenproblem. Berlin, Borntraeger, 1923. 80 p. Bibl., p. 78-80.

FARADAY SOCIETY, LONDON. The physical chemistry of igneous rock formation; a general discussion held by the Faraday Society, the Geological Society, and the Mineralogical Society, October, 1924. *Trans. Faraday Soc.* 20: 457-458 (1925).

LOWE, EDWIN E. The igneous rocks of the Mountsorrel district, their relationship to each other and to the Charnwood Forest area. Leicester, Leicester Literary and Philosophical Soc., 1926. 49 p. Bibl., p. 46-49.

MAWSON, DOUGLAS. Brief résumé of present knowledge relating to the igneous rocks of South Australia. *Australasian Assoc. Adv. Sci.* 18: 264-265 (1928). 49 references.

ROCKS—Cont'd

SCHEUMANN, K. H. *Ausländische Systematik, Klassifikation und Nomenclatur der Magmengesteine. I. Fortschritte Mineral. Krist. Petr.* 10: 187-310 (1925). Bibls. on p. 194; 207-208; 226-227; 239-240; 244-246; 255; 302-310.

SHAND, SAMUEL J. *Eruptive rocks, their genesis, composition, classification, and their relation to ore-deposits, with a chapter on meteorites.* London, Murby, 1927. 360 p. Bibl. at end of chapters.

STARK, M. (Petrographic provinces.) *Fortschr. Min. Krist. Petr.* 4: 312-336 (1914). 533 references.

TYRRELL, G. W. Review of recent work on the origin and differentiation of igneous rocks. *Trans. Faraday Soc.* 20: 418-427 (1925). Bibl. footnotes.

WETZEL, W. *Sedimentpetrographie.* *Fortschritte Mineral., Krist. Petr.* 8: 107-108; 128-132; 150-152; 161-162; 189-191; 197-198 (1923).

ROOFING TILE

THAMM, J. *Aus der Neueren Patentliteratur des Dachziegels.* *Tonind. Ztg.* 51: 1300-1302 (1927). 36 patents.

ROSIN*

BOBROR, P. A. "Pine resin acids and their behavior at high temperatures." *Trans. Viatka Sci. Res. Inst.* 2: 29-39 (1926).

See also RESINS.

RUBBER

ALADIN, —. *Kautschuk-Konservierung.* *Gummi-Ztg.* 42: 644-645 (1927). 24 patents.

BARY, PAUL. *La régénération des caoutchoucs.* *Rev. gén. mat. plastique* 2: 485-493, 655-660, 726-727, 792-796 (1926); 3: 113-116, 176-178, 329-336, 395-399, 461-465 (1927). 68 references.

BARRY, P., and HAUSER, E. A. *Ueber Kautschukstrukturforschung.* *Kautschuk* 4: 96-102 (1928); *Rev. gén. caoutchouc*, June, 1928. 54 footnotes.

BONGRAND, JEAN CH. *Les études sur le caoutchouc et son industrie.* *Chimie et industrie* 14: 837-838 (1925). 115 references.

CHAPLET, A. *Manuel de l'industrie du caoutchouc.* Paris, Baillière, 1925. 247 p. Bibl., p. 242-244.

CHERBULIEZ, A. *Altération par le temps du caoutchouc brut et du caoutchouc vulcanisé.* *Recherches et inventions* 6: 877-880 (1925); 7: 102-107, 135-139 (1926). 68 references.

CHUTE, H. O. A review of recent progress in rubber chemistry. *India Rub-*

ber World 51: 265-267, 322-323, 578-579 (1915). References through text.

DALES, B. The colloid chemistry of rubber. *India Rubber W.* 79, no. 4: 53-57 (1929). 29 footnotes.

DAVEY, W. CECIL. Spraying of rubber latex with protective colloids, particularly glue. *J. Soc. Chem. Ind.* 44: 517T (1925). 21 references.

DINSMORE, R. P. Composition and structure of Hevea rubber. *Ind. Eng. Chem.* 18: 1145 (1926). 66 references.

EATON, B. J., GRANTHAM, J., and DAY, F. W. F. Preparation and vulcanization of plantation Para rubber. *Fed. Malay States, Agric. Dept., Bull.* 27 (1918). Bibl., p. 395-398. 56 references.

FIGART, DAVID M. Crude rubber survey. The plantation rubber industry in the Middle East. U. S. Dept Commerce, Trade Promotion Series, No. 2. 1925. 317 p. Bibl., p. 303-311. 250 references.

FONROBERT, EWALD. *Der Kautschuk im Jahre 1920.* *Kolloid.-Z.* 29: 200-204 (1921). 230 references.

GEER, WILLIAM C. 25 Jahre Kautschukchemie. *Kunststoffe* 16: 88-89 (1926).

GRENQUIST, ERNST A. Dispersion of pigments in rubber. I. Microscopical studies of agglomeration and flocculation. *Ind. Eng. Chem.* 20: 1073-1078 (Oct., 1928). 63 references.

HALEN, S. *Tabelle der neueren Verfahren zur Fällung von Kautschukmilch.* *Kunststoffe* 14: 117-118 (1924). 30 patents.

HAUSER, E. A. *Latex.* Dresden, Steinkopff, 1927. Bibl. footnotes and patent bibl. by C. B. v. Boernegg. Classified by countries, p. 181-223.

HÜBENER, G. *Zusammenfassende Besprechung der bisher erschienenen Arbeiten über die Natur und Aufbereitung des Latex.* *Kolloid.-Z.* 16: 5-13 (1915). 20 references.

KAUSCH, O. *Tabellarische Uebersicht der Patente betreffend der Kautschuksynthese und der Herstellung der hierzu erforderlichen Ausgangsstoffe.* *Kunststoffe* 5: 123-125, 137-138 (1915).

KEMPSKI, KARL E. *Die Rubberkultur unter besonderer Berücksichtigung der Gewinnung des Plantagen-Kautschuks in Niederländisch-Indien.* Berlin, Parey, 1924. 50 p. Bibl., p. 38-46.

KIRCHHOF, F. *Fortschritte in der Chemie, Physik und Technologie des Kautschuks und seiner wichtigsten Zusatzstoffe.* *Kautschuk* 4: 61-63 (1928). 18 bibl. footnotes.

- KIRCHHOF, F. Fortschritte in der Kautschuk-Technologie. Dresden, Steinkopff, 1927. 201 p. Bibl., p. 150, 158.
- LARUE, CARL D. The Hevea rubber tree in the Amazon Valley. U. S. Dept. Agr., Dept. Bull. no. 1422. 1926. 70 p. Bibl., p. 67-69.
- LUFF, B. D. W. The chemistry of rubber. N. Y., Van Nostrand, 1924. 232 p. Bibl. footnotes.
- MACLAREN, W. A. Rubber, tea and cacao. London, Benn, 1924. 334 p. Bibl., p. 323-326.
- MAAS, JOHAN G. J. A. Het tapsysteem bij *Hevea brasiliensis* op experimenteelen grondslag. Proefschrift, Wageningen, 1924. 202 p. Bibl., p. 187-195. 226 references.
- MIKISCH, K., and HÖNIG, M. Die Kautschukgruppe. In Wiesner, Die Rohstoffe des Pflanzenreiches I: 437-539 (1924). Bibl. footnotes.
- PEARSON, H. C. Pneumatic tires. N. Y., India Rubber Pub. Co., 1922. 1322 p. List of patents on tire machinery, p. 1213-1290.
- PIECK, MARIANNE. Die Kautschukforschung. 1924. Gummi-Ztg. 39: 1427-1430, 1490, 1492 (1925); 74 references. 1925. *Ibid.* 40: 1977-1979, 2033-2034 (1926); 84 references. 1926. *Ibid.* 41: 1633-1634, 1686-1688, 1746-1747 (1927); 89 references. 1927. *Ibid.* 42: 1632-1633, 1690-1692, 1743-1744 (1928); 150 references.
- PIECK, MARIANNE. Fortschritte auf dem Gebiete der Kautschukchemie in den Jahren 1921-1923. Gummi-Ztg. 39: 435-437 (1925). 164 references.
- PIECK, MARIANNE. Les récents progrès dans l'industrie du caoutchouc. Rev. gén. mat. plastiques 3: 718 (1927); 51 references. 4: 49-53 (1928); 59 references.
- PIECK, MARIANNE. Récentes découvertes dans la domaine du caoutchouc. Rev. gén. mat. plastique 2: 791 (1926); 3: 57 (1927). 84 references.
- POHLE, HANS. Beiträge zur Kenntnis der Kautschuke, insbesondere zweier Dimethyl-Kautschuke. Kolloidchem. Beihefte 13: 1-60 (1920). 28 references, p. 60.
- PORRITT, B. D. Some problems of the paint and rubber industries. J. Oil Colour Chem. Assoc. 8: 153-154 (1925). 35 references.
- RESEARCH ASSOCIATION OF BRITISH RUBBER AND TIRE MANUFACTURERS. Library Catalogue. Cambridge, 1927. 210 p.
- ROSSMAN, JOSEPH. Direct uses of waste rubber. India Rubber World 77, no. 6: 60-61 (1928). 56 patents.
- ROSSMAN, J. The history of elastic fabrics. India Rubber W. 79, no. 4: 59-62 (1929). 59 patents.
- RUTGERS, A. A. L. Rubber bibliography, 1901-1906. Batavia, 1917. 84 p. (Mededeelingen van het Algemeen Proefstation der A. V. R. O. S. Rubber series No. 5).
- SCHIDROWITZ, PHILLIP. The direct use of rubber latex, especially vulcanized latex. Ind. Eng. Chem. 18: 1147-1152 (1926). 41 references.
- SCHOTZ, S. P. Synthetic rubber. London, Benn, 1926. 144 p. References through text.
- SCHURZ, WM. L., et al. Crude rubber survey. Rubber production in Amazon Valley. U. S. Dept Commerce, Trade Promotion Series No. 23. 1925. 369 p. Bibl., p. 365-369.
- SOCIETY OF CHEMICAL INDUSTRY. India-Rubber. In Report of the progress of applied chemistry 10: 404-433 (1925); 194 footnotes. 11: 393-425 (1926); 164 footnotes. 12: 398-422 (1927); 112 footnotes. 13: 425-445 (1928); 173 footnotes.
- SPECIAL LIBRARIES ASSOCIATION. Rubber Committee. Bibliography on rubber technology 1924-June, 1926. Compiled for the Technology group of the Special Libraries Assoc., N. Y., 1926. 7 pts. Contents: Sect. 1. Latex and raw rubber, comp. by E. B. Wray. Sect. 2. Compounding ingredients, including organic accelerators, comp. by E. L. Shearer. Sect. 3. Physics of rubber, including physical and mechanical testing, comp. by E. L. Shearer. Sect. 4. Chemistry of rubber, including chemical analysis, comp. by E. L. Shearer. Sect. 5. Manufacturing methods and devices applicable to rubber goods in general, comp. by J. A. Cushman. Sect. 6. Synthetic rubber and rubber substitutes, comp. by J. F. Smith. Sect. 7. Reclaiming rubber, comp. by R. L. Vormelker.
- SPECIAL LIBRARIES ASSOCIATION. Bibliography on rubber technology, June, 1926-December, 1927. N. Y., The Association, 1928. 81 p. Information Bull. no. 7.
- STOLL, L. Ein Beitrag zur Frage der Kautschukumwandlungstemperatur bei etwa 60 bis 80° C. Gummi-Ztg. 42: 745 (1927). 24 footnotes.
- STOLL, LUDWIG. Ueber Regeneration. Gummi-Ztg. 39: 1798-1800 (1925). 159 references.
- TARD, HENRI. Économie et politique du caoutchouc, le plan Stevenson, ses résultats, études des éléments du marché futur. Paris, Imprimerie les

RUBBER—Cont'd

presses modernes, 1928. 200 p. Bibl., p. 196-197.

TRADWELL, JOHN C., HILL, C. REED, and BENNETT, H. H. Possibilities for Para rubber production in northern tropical America. 375 p. U. S. Bur. Foreign and Domestic Commerce. Dept. of Commerce. Trade Promotion Ser. no. 40. Crude rubber survey. no. 6. 1926. Bibl., p. 371-375.

VAN ROSSEM, A. Rubber latex. Its properties and the development of its industrial application. J. Soc. Chem. Ind. 44: 33-41T (1925). 77 footnotes.

VANCE, C. F., *et al.* Crude rubber survey. Possibilities for para rubber production in the Philippine Islands. U. S. Dept. Commerce, Trade-Promotion Series, No. 17. 1925. 101 p. Bibl., p. 100-101.

VRIES, O. DE. Estate rubber; its preparation, properties and testing. Batavia, Drukkerijen Ruygrok, 1920. 649 p. Bibl., p. 634-637.

WEER, LOTHAR E. The chemistry of rubber manufacture. Based on the fifth edition of "The Chemistry of India Rubber," by Carl O. Weber. London, Griffin, 1926. 372 p. Bibl., p. 116-119, 328-335.

WHITBY, G. STAFFORD. Rubber, Gutta-percha and balata. International critical tables II: 295-296 (1927). 231 references.

WHITFORD, H. N., and ANTHONY, ALFRED. Crude rubber survey. Rubber production in Africa. U. S. Dept. Commerce, Trade Promotion Series No. 34. 1926. 136 p. Bibl., p. 132-136.

ZIMMERMAN, A. Kautschuk, Gutta-percha and Balata. In Wiesner, Die Rohstoffe des Pflanzenreiches, 1782-1784 (1928).

See also ACCELERATORS; GUTTA-PERCHA; LATEX; LEATHER (Enna); VULCANIZATION.

RUBIDIUM ARSENATES. *See* ARSE-NATES.**RUTHENIUM**

KRAUSS, F. Zur Chemie des Rutheniums. Z. angew. Chem. 41: 417-418 (1928). 93 references.

WOHLER, L., BALZ, PH., and METZ, L. Die Oxyde des Rutheniums. Z. anorg. allgem. Chem. 139: 205-219 (1924). 23 footnotes.

See also RARE EARTHS.

RUTILE. *See* TITANIUM OXIDES.**RUTIN ***

CHARAUX, C. Sur le dédoublement biochimique de la rutine.-Rutinoase, nou-

veau biose, provenant de ce dédoublement. Bull. soc. chim. biol. 6: 639-640. (1924). 39 references.

SACCHARASE

SVANBERG, OLOF. Die Methoden zur Darstellung von Saccharase (Invertin)-Präparaten. In Abderhalden, Handb. biol. Arbeitsm. IV, pt. 1: 249-258 (1925). Bibl. footnotes.

See also ENZYMES.

SACCHARIMETRY *

BATES, FREDERICK, PHELPS, F. P., and SNYDER, C. F. Saccharimetry, the properties of commercial sugars and their solutions. International critical tables II: 355 (1927). 97 references.

See also REFRACTOMETERS.

SACCHARIN

HERZOG, WALTHER. Die Verwertung der Nebenprodukte der Saccharinfabrikation. Sammlung chem. chem.-tech. Vorträge 29: 99-264 (1926). Bibl. footnotes.

KLAGES, —. Saccharin. In Muspratt 4, no. 2: 1455-1459 (1922).

See also SWEETENING AGENTS.

SAFRON

PIERLOT, GEORGES. Le safran. Chimie et industrie 14: 850 (1925). 14 references.

See also DYES.

SALICYLATES

HANZLIK, PAUL J. Actions and uses of the salicylates and cinchophen in medicine. Baltimore, Williams & Wilkins, 1927. 200 p. Bibl., p. 183-200.

SALIVA

CLARK, GUY W., and CARTER, KENNETH L. Factors involved in the reaction changes of human saliva. J. Biol. Chem. 73: 404-405 (1927). 25 references.

CLARK, GUY W., and SHELL, JOHN S. The influence of diet upon the inorganic constituents of human saliva. Dental Cosmos 59: 616-617 (1927). 44 references.

PEABODY, W. A., HALL, J. C., and LEWIS, R. C. Bacterial growth as a factor in the deposition of calcium from saliva. Dental Cosmos 69: 1087-1094 (1927).

UPDEGRAFF, H., and LEWIS, H. B. The organic constituents of saliva. J. Biol. Chem. 61: 647-648 (1924). 14 references.

SALMON

FELLERS, CARL R. Bacteriological investigations on raw salmon spoilage. Univ. of Washington Publications in Fisheries 1, no. 8 (1926). 36 p. Bibl., p. 34-36.

- FELLERS, CARL R., *et al.* Canned salmon: a five-year correlation study of certain quality factors. Univ. of Washington Publications in Fisheries 1, no. 9 (1926). 20 p. Bibl., p. 20.
- GREENE, CHAS. W. The physiology of the spawning migration. *Physiol. Rev.* 6: 235-241 (1926).
- JARVIS, NORMAN D., *et al.* Iodine content of the Pacific coast salmon. Univ. of Washington Publications in Fisheries 1, no. 6 (1926). 29 p. Bibl., p. 23-29.
- SALT**
- ALLING, HAROLD L. The geology and origin of the Silurian salt of New York state. New York State Museum Bull. no. 275 (1928). 139 p. Bibl., p. 127-132.
- SALTS***
- THOMAS, WILLIAM. Complex salts. N. Y., Van Nostrand, 1924. 133 p. Contains bibl. footnotes.
- SALTS: Physiological effect.***
- MITRA, SWARNA K. Toxic and antagonistic effects of salts on *Saccharomyces ellipsoideus*. Thesis, Ohio State Univ., 1920. 96 p. Bibl., p. 81-96.
- SALVARSAN**
- POPP, FRIEDRICH. Therapeutische Versuche mit Salvarsan bei Hundestaupe. Inaug.-Diss. Tierarztl. Hochschule, Berlin, 1922. 32 p. Bibl., p. 28-30.
- See also* ARSENIC: ORGANIC COMPOUNDS.
- SAMPLING**
- BARTON, W. H., and DOANE, L. H. Sampling and testing highway materials. N. Y., McGraw, 1925. 355 p.
- BLANCK, F. C. Bibliography on sampling foods. J. Assoc. Off. Agr. Chem. 10: 98 (1927). 16 references.
- BROCKETT, R. N. Bibliography on sampling fertilizers. J. Assoc. Off. Agr. Chem. 12: 98 (1929). 11 references.
- FREY, R. W. Bibliography on sampling tanning materials and leather. J. Assoc. Off. Agr. Chem. 10: 96-97 (1927). 50 references.
- MCCALL, A. G., and MCKIBBEN, R. R. Memorandum on sampling of soils. J. Assoc. Off. Agr. Chem. 10: 93-96 (1927). 20 references.
- PAUL, A. E. Sampling drugs. J. Assoc. Off. Agr. Chem. 10: 99-102 (1927). 12 references.
- WESSON, DAVID. Bibliography on sampling. J. Oil Fat Ind. 1: 47-51 (1924).
- ZERBAN, F. W. Bibliography on sampling saccharine products. J. Assoc. Off. Agr. Chem. 10: 97-98 (1927).
- SAND**
- LADOO, R. B. Sand and gravel. *In his* Non-metallic minerals 514-515 (1925).
- RICHARDSON, CHARLES H. The molding sands of Kentucky. A detailed report covering the field examination, mechanical analysis and industrial evaluation of the principal molding sand deposits of the state. Kentucky Geol. Surv. Ser. VI (Geol. Repts.), v. 29. 1927. 64 p. Bibl., p. 63-64.
- TEAS, L. P. Preliminary report on the sand and gravel deposits of Georgia. Ga. Geol. Surv., Bull. 37, 1921. 392 p. Bibl., p. 368-371.
- WEIGEL, W. M. Technology and uses of silica and sands. U. S. Bur. Mines, Bull. 266. 1927. 199 p. Bibl. footnotes.
- See also* QUARTZ; SILICA AND SILICATES.
- SAND-LIME BRICK**
- LADOO, R. B. Sand-lime brick. *In his* Non-metallic minerals, 519 (1926). 19 references.
- SANITATION**
- EARP, J. ROSSLYN. Odors—their sanitary significance and their elimination. J. Am. Public Health Assoc. 13: 292-293 (1923). 34 references.
- SCHACHNER, RICHARD. Gesundheitstechnik im Hausbau. Munchen, Oldenbourg, 1926. 437 p. Bibl. at end of each section.
- SOCIETY OF CHEMICAL INDUSTRY. Sanitation and water purification. *In* Reports of the progress of applied chemistry 11: 566-588 (1926); 50 footnotes. 12: 591-625 (1927); 95 footnotes. 13: 588-611 (1928); 63 footnotes.
- See also* HYGIENE; SEWAGE; VENTILATION.
- SANTONIN**
- EDER, R., and SCHNEITER, W. Bestimmung des Santonins in *Flores cinæ*. Schweiz. Apoth.-Ztg. 63: 405, 421, 433, 453 (1925). 31 footnotes.
- SAPONIN**
- BOAS, F. Saponine. *In* Wiesner, Die Rohstoffe des Pflanzenreiches, 1827-1830 (1928). 193 references.
- KARSMARK, KARL A. Om saponiner och saponindroger. Svensk Farm. Tids. 29: 453-459, 467-472 (1915). Bibl. footnotes.
- KOFER, LUDWIG. Die Saponine. Berlin, Springer, 1927. 278 p. Bibl., p. 259-271.
- WINTERSTEIN, ALFRED. Beiträge zur Kenntnis der Saponine. Weida, Thomas & Hubert, 1923. 100 p. Bibl., p. 98-100.
- SAUERKRAUT***
- LEFEVRE, EDWIN. The commercial production of sauerkraut. U. S. Dept of Agr., Cir. no. 35. 1928. 31 p. Bibl., p. 29-30.

SCUMMING *

JACKSON, F. G. A descriptive bibliography of scumming and efflorescence. *Bull. Am. Ceram. Soc.* 4: 376-401 (1925). Chronological. Annotated.

REYNOLDS, M. E. Scumming and efflorescence. *Bull. Am. Ceram. Soc.* 4: 682-683 (1925). 13 references.

See also CERAMICS.

SEA WATER. See WATER.**SEDIMENTATION**

ODEN, SVEN. Sedimentation analysis and its application to the physical chemistry of clays and precipitates. *In* Alexander, *Colloid chemistry I*: 907-909 (1926). 76 references.

See also ROCKS (Berz).

SEEDS *

HANAUSEK, T. F., and WEESE, J. Samen. *In* Wiesner, *Die Rohstoffe des Pflanzenreiches III*: 662-790 (1921). Bibl. footnotes.

SEIDLITZ POWDERS *

NEUMANN, ARTHUR H. A century of the United States pharmacopoeia 1820-1920. *Pulvis effervescens compositus*. *Bull. Univ. Wisconsin, Serial no. 1304*. (General Ser. no. 1081). 1925. 42 p. Bibl., p. 32-42.

SELENIUM

DOELTER, C. Selenmineralien. *In his* *Handb. Mineralchem.* 4, pt. 1: 805-813 (1926). 90 references.

DOTY, MARION FOSTER. Selenium, a list of references, 1817-1925. 114 p. N. Y., Public Library, 1927. Contains author, patent and subject index. *Reprinted from* N. Y. Pub. Lib., *Bul.* 30: 440-448, 525-555, 599-629, 728-737, 793-784 (1926).

LENHER, VICTOR. Quantitative determination of selenium and tellurium. *Proc. Am. Phil. Soc.* 65: 33-50 (1926). 35 references.

LOTTERMOSER, A. Kolloidchemie des Selens. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 1, 1st half: 794-795 (1927). 39 references.

MARTIN, R. EARL. Bibliography of literature bearing on the light-sensitivity of selenium. *Proc. Indiana Acad. Sci.* 36: 163-181 (1926). 335 references with subject index.

MEYER, JULIUS. Selen. *In* Abegg, *Handb. anorg. Chem.* 4, pt. 1, 1st half: 767-799 (1927). 505 references.

SKOWRONSKI, S. Selenium and tellurium. *Min. Ind.* 33: 647-649 (1924); 35: 614-615 (1927); 36: 525-526 (1928).

SELENIUM: Organic compounds *

ANDERSON, CARL N. 2, 4-Diphenylselenophene, its derivatives and re-

lated compounds. A new synthesis of 2-phenylbenzoselenazole from *o*-nitrochlorobenzene. Thesis, Columbia Univ., 1925. 26 p. Bibl., p. 25-26.

BRADT, W. E., and LYONS, R. E. Available methods for the determination of selenium in organic compounds. *Proc. Indiana Acad. Sci.* 36: 200-201 (1926). 49 references.

SERPENTINE. See MAGNESIUM SILICATES.**SERUM**

OARB, HARRY C., and PETERS, JOHN P. Concentration of acid and base in the serum in normal pregnancy. *J. Biol. Chem.* 8: 25-27 (1929). 69 references.

REINER, L. Colloid chemical problems of serology. *In* Alexander, *Colloid chemistry II*: 755-756 (1928). 64 references.

WOLFF-EISNER, ALFRED. *Handbuch der experimentellen Therapie, Serum- und Chemotherapie; ein Handbuch für die ärztliche Praxis und Klinik.* 2 Aufl. München, Lehmann, 1926. 790 p. Contains bibls.

See also BLOOD; PROTEINS.

SEWAGE

ADENEY, WALTER ERNEST. The principles and practice of the dilution method of sewage disposal. Cambridge, Univ. Press, 1928. 161 p. Bibl., p. 155-157.

BACH, HERMANN. *Die Abwasserreinigung; Einführung zum Verständnis der Kläranlagen für städtische und gewerbliche Abwässer.* München, Oldenbourg, 1927. 183 p. Bibl., p. 171-176.

BACH, HERMANN. *Fortschritte im Wasserversorgungs- und Abwasserbeseitigungswesen.* Chem.-Ztg. 49: 4-5, 47-48, 81-82, 103, 110, 174-175, 197-199, 213-214, 241-243 (1925). 314 footnotes.

BABBIT, HAROLD EATON. *Sewerage and sewage treatment.* 3rd ed. N. Y., Wiley, 1928. 545 p. Bibl., p. 475-476, 517-518.

BUSWELL, A. M. The chemistry of water and sewage treatment. N. Y., Chem. Cat. Co., 1928. 362 p. About 400 references.

FULLER, GEORGE W., and MCCLINTOCK, JAMES R. *Solving sewage problems.* N. Y., McGraw-Hill, 1926. 548 p. Bibl., p. 527-528.

HATFIELD, WILLIAM D. The fertilizer value of activated sludge. Thesis, Illinois Univ., 1918. Bibl., p. 51-53.

IMHOFF, KARL. *Fortschritte der Abwasserreinigung.* 2nd ed. Berlin, Heymanns, 1926. 136 p. Bibl., p. 117-127.

MARTIN, ARTHUR J. The activated sludge process. London, Macdonald and Evans, 1927. 415 p. Bibl., p. 369-394.

MILLER, ROBERT C., RAMAGE, WM D., and LAZIER, EDGAR L. Study of physical and chemical conditions in San Francisco Bay, especially in relation to the tides. Univ. California Publ. Zool. 31: 201-267 (1928). Bibl., p. 263-267.

MÜLLER, ARNO. Literaturliste der Arbeiten auf dem Gebiete der Mykologie der Gebrauchs- und Abwässer. Z. Gärungsphysiol. 2: 338-346 (1913); 4: 133-137 (1915); 5: 222-231 (1916). Covers 1912-1913.

SHIVE, ROY A. Rôle of bioprecipitation in sewage treatment. III. State Water Survey, Bull. 25: 82-84 (1928).

STRICKHOUSER, SHERMAN I. Studies on the relation of the depth of a sprinkling filter to the degree of purification. III. State Water Survey, Bull. No. 26. 1928. Thesis, Univ. of Ill., 1926. 76 p. Bibl., p. 74-76.

TILTMANS, J. Wasserreinigung und Abwässerbeseitigung. Halle, Knapp, 1912. 157 p. Bibl., p. 124-125.

See also SANITATION; WASTE; WATER.

SEX ORGANS

GERHARTZ, HEINRICH. Männliche Geschlechtsorgane. In Oppenheimer, Handb. Biochem. 4: 652-662 (1924). 59 footnotes.

PERITZ, G. Die männliche Keimdrüse. In Oppenheimer, Handb. Biochem. 2nd ed., 9: 366-385 (1926). 68 footnotes.

PERITZ, G., and SCHERK, G. Die weibliche Keimdrüse. In Oppenheimer, Handb. Biochem., 2nd ed., 9: 329-365 (1926). 145 footnotes.

WADEHN, E. Ueber Sexualhormone, insbesondere das Feminin. Z. angew. Chem. 41: 352-355 (1928). 35 footnotes.

ZUNTZ, LEO. Weibliche Geschlechtsorgane. In Oppenheimer, Handb. Biochem. 4: 663-679 (1924). 134 footnotes.

See also HORMONES.

SILAGE

BACHMANN, JAKOB A. Einiges über Säuren und Aminosäuren aus Silofutter. Promotionsarbeit, Tech. Hochschule, Zürich, 1927. 120 p. Bibl., p. 114-120.

KLEIBER, MAX. Ueber die elektrische Konservierung von saftigem Futter (Elektrosilierung). Promotionsarbeit, Tech. Hochschule, Zürich, 1924. 106 p. Bibl., p. 104-106.

KUCHLER, LUDWIG F. Die zeitgemässe Grünfütterkonservierung; ein Ratgeber für Silofragen, insbesondere auch für Mittel- und Kleinlandwirte. Freising-München, Datterer, 1926. 525 p. Bibl., p. 447-462.

SILICA: Fused.

FLUSIN, G. Le verre de silice. Chimie et industrie 3: 748-749. About 125 classified references on silica and silica glass.

SILICA AND SILICATES

AHLERS, LEONHARD. Ueber die Dichte von Quarz, Orthoklas, Albit und Anorthit. Z. Krystall. 59: 293-334 (1924). Bibl. footnotes and through text.

GREEN, A. T. A consideration of the properties of silica and fireclay products in relation to the carbonizing industries. Gas J., Special No.: 65-77 (Feb. 14, 1928). A discussion with an extensive list of references appended.

LITINSKY, LEONID. Schamotte und Silika: ihre Eigenschaften, Verwendung und Prüfung. 1925. Bibl., p. 256-276.

LU, KAI-CHING. Deformation study of various aluminosilicates and borosilicates. J. Am. Ceram. Soc. 9: 29-54 (1926). 34 footnotes.

MELLOR, J. W. The physical properties of silicon dioxide. In his Inorg. theor. chem. 6: 267-274 (1925). About 1000 references. Chemical properties, *Ibid.* 285-288; about 250 references.

MELLOR, J. W. The preparation of silicon dioxide—Quartz, tridymite and cristobalite. In his Inorg. theor. chem. 6: 243-245 (1925). About 150 references.

MELLOR, J. W. Silicon suboxides and oxyhydrides—Siloxanes. In his Inorg. theor. chem. 6: 236-237 (1925). About 30 references.

MELLOR, J. W. The alkali and ammonium silicates—Waterglass. In his Inorg. theor. chem. 6: 338-340 (1925). About 250 references.

MELLOR, J. W. Cobalt and nickel silicates. In his Inorg. theor. chem. 6: 933-934 (1925). 40 references.

MELLOR, J. W. Copper, silver and gold silicates. In his Inorg. theor. chem. 6: 345-347 (1925). About 175 references.

MELLOR, J. W. Molybdenum, tungsten and uranium silicates—Heteropolyacids. In his Inorg. theor. chem. 6: 890-892 (1925). About 250 references.

MELLOR, J. W. The silicates and aluminosilicates. In his Inorg. theor.

SILICA AND SILICATES—Cont'd

chem. 6: 315-317 (1925). About 150 references.

MELLOR, J. W. The silicates of the alkaline earths. *In his* Inorg. theor. chem. 6: 373-380 (1925). About 1000 references.

MELLOR, J. W. The silicates of the phosphorus family. *In his* Inorg. theor. chem. 6: 839 (1925). About 40 references.

MELLOR, J. W. The silicates of the titanium lead family. *In his* Inorg. theor. chem. 6: 859-865 (1925). About 750 references.

MELLOR, J. W. Zinc, cadmium and mercury silicates. *In his* Inorg. theor. chem. 6: 445-447 (1925). About 250 references.

PECK, ALBERT H. Changes in the constitution and microstructure of andalusite, cyanite and sillimanite at high temperatures and their significance in industrial practice. *J. Am. Ceram. Soc.* 8: 428-429 (1925). 22 references.

PONOMAREV, I. F. Synopsis of literature concerning the chemical combination of silica. *Trans. Inst. Exp. Silicates (Russian)* 9: 1-91 (1924). Review for years 1912-1913.

SOSMAN, ROBERT B. Electrical and optical properties of silica. *International critical tables* VI: 344 (1929). 94 references.

SOSMAN, ROBERT B. Mechanical and thermal properties of the various forms of silica. *International critical tables* IV: 22 (1928). 81 references.

SOSMAN, ROBERT B. The properties of silica; an introduction to the properties of substances in the solid non-conducting state. *N. Y., Chem. Cat. Co.*, 1927. 856 p. Bibl. footnotes.

VAIL, JAMES G. Silicate solutions and siliceous gels. *J. Soc. Chem. Ind.* 44: 214-219T (1925). 59 footnotes.

See also REFRACTORIES.

SILICA GEL

KAUSCH, OSCAR. Das Kieselsäuregel und die Bleicherden. Berlin, Springer, 1927. 292 p. Bibl., p. 259-266; patents, p. 267-276.

MELLOR, J. W. Silicic acids or colloidal silica. *In his* Inorg. theor. chem. 6: 304-307 (1925). About 300 references.

RUFF, O., and MAUTNER, —. Die aktiven Formen der Kieselsäure (Silikagel) und deren Adsorptionsvermögen. *Z. angew. Chem.* 40: 428-434 (1927). Bibl., p. 433-434. 86 references.

VAIL, JAMES G. Soluble silicates in industry. *N. Y., Chem. Cat. Co.*, 1928. 443 p. 1300 footnotes.

SILICIDES

HOENIGSCHMID, OTTO. Karbide und Silicide. Halle, Knapp, 1914. 263 p. Bibl. footnotes.

MELLOR, J. W. The silicides of the alkali and copper families of elements. *In his* Inorg. theor. chem. 6: 175-176 (1925); about 50 references. The silicides of the calcium family. *Ibid.* 179; about 25 references. The silicides of the magnesium-zinc family. *Ibid.* 182-183; about 30 references. The silicides of the aluminium and rare earth families. *Ibid.* 185-186; about 50 references. The silicides of the titanium and tin families. *Ibid.* 188; about 25 references. The silicides of the vanadium and chromium families. *Ibid.* 194; about 30 references. The silicides of manganese and of the iron family. *Ibid.* 209-211; about 175 references. The silicides of the platinum family. *Ibid.* 214; about 25 references.

SILICODUODECITUNGSTIC ACID*

NORTH, EDWARD O. The preparation, properties and uses of silicoduodecitungstic acid. Thesis, Univ. of Illinois, 1924. 22 p. Bibl., p. 13-14, 21.

SCROGGIE, ARTHUR G. Studies on the preparation, properties and structure of silicoduodecitungstic acid. Thesis, Univ. of Illinois, 1928. 12 p. Bibl., p. 11.

SILICON

MELLOR, J. W. Silicon. *In his* Inorg. theor. chem. 6: (1925). History, p. 137; about 30 references. Occurrence of silicon and silica, p. 143-145; about 150 references. Preparation, p. 151-152; about 125 references. Physical properties, p. 158-160; about 200 references. Chemical properties, p. 164-165; about 50 references. Atomic weight and valency, p. 168; about 75 references.

See also SILICA AND SILICATES.

SILICON BROMIDES*

MELLOR, J. W. Silicon bromides. *In his* Inorg. theor. chem. 6: 981-982 (1925). 30 references.

SILICON CHLORIDES*

MELLOR, J. W. Silicon chlorides. *In his* Inorg. theor. chem. 6: 975-977 (1925). 200 references.

SILICON FLUORIDES*

MELLOR, J. W. Silicon fluorides. *In his* Inorg. theor. chem. 6: 939-940 (1925). 50 references.

SILICON HYDRIDES

MELLOR, J. W. The hydrogen compounds of silicon. *In his* Inorg. theor. chem. 6: 226-227 (1925). About 50 references.

STOCK, ALFRED. Siliciumwasserstoffe. *Z. Elektrochem.* 32: 341-349 (1926). Bibl. footnotes; bibl. of 22 papers by Stock.

SILICON IODIDES *

MELLOR, J. W. Silicon iodides. *In his Inorg. theor. chem.* 6: 985 (1925). 15 references.

SILICON PHOSPHATES *

MELLOR, J. W. Silicon phosphates. *In his Inorg. theor. chem.* 6: 991 (1925). 10 references.

SILICON SULFIDES *

MELLOR, J. W. Silicon sulfides. *In his Inorg. theor. chem.* 6: 989-990 (1925). 40 references.

SILK

DENHAM, W. S. Properties of the silk fibre. *Trans. Faraday Soc.* 20: 259-268 (1925). Bibl. footnotes.

UNTIEDT, F. H. Weighting of silk. *Textile Colorist* 48: 315-318, 387-390 (1926). 74 patents.

See also FIBERS; RAYON; VISCOSE.

SILLIMANITE. See ALUMINUM SILICATES.

SILVER: Colloidal.

WIEGEL, ERNST. Ueber die Farben des kolloiden Silbers unter besonderer Berücksichtigung der Flockungsfarben. *Kolloidchem. Beihefte* 25: 176-230 (1927). 52 references.

See also GOLD (Bernewitz).

SILVER ARSENATES. See ARSENATES.

SILVER BROMIDE

FRANKENBURGER, W. Ueber die spektrale Empfindlichkeit des Bromsilbers und ihre Beeinflussung durch adsorbierte Stoffe. *Z. physik. Chemie* 105: 273-328 (1923). Bibl. footnotes.

SILVER SILICIDES. See SILICIDES.

SILVER SULFIDES

HENGLEIN, M. Verbindungen von S, As, Sb, Bi mit Silber. *In Doelter, Handb. Mineralchem.* 4, pt. 1: 221-300 (1926). Bibl. footnotes.

HENGLEIN, M. Argentit und Akanthit. *In Doelter, Handb. Mineralchem.* 4, pt. 1: 225-234 (1926). 50 footnotes.

SIZING

FARROW, FREDERICK D. Recent advances in the experimental study of warp sizing. *Trans. Faraday Soc.* 20: 308 (1925). 26 references.

WALTON, ROBERT P. A comprehensive survey of starch chemistry. N. Y., Chem. Cat. Co., 1928. Sizing, v. 1: 228-242.

See also FIBERS; LATEX; PAPER.

SKIN

SCHULZ, F. N. Hautabscheidungen und Tränen. *In Oppenheimer, Handb.*

Biochem. 5: 385-418 (1924). 162 footnotes.

URBACH, ERICH. Die biologisch-chemische Forschungsrichtung in der Dermatologie. *In Wiener klin. Wochschr.* 41: 581-584, 634-636 (1928). 47 footnotes.

SLIMES *

MELCHIOR, H., and KONSTANTY, E. Schleime. *In Wiesner, Rohstoffe des Pflanzenreiches*, 1906-1912 (1928).

SMOKE *

CANNON, LUCIUS HANCHETT. Smoke abatement; a study of the police power as embodied in laws, ordinances and court decisions. St. Louis Public Library, 1924. *Mo. Bull.*, Aug.-Sept., 1924. Bibl., mostly since 1913, p. 305-312.

FULTON, C. H. Metallurgical smoke. *Bur. Mines, Bull.* no. 84, 1914. 94 p. Bibl., p. 88-89.

GIBBS, W. E. Clouds and smokes. Philadelphia, Blakiston, 1924. 240 p. Bibls. at ends of chapters.

PRIESTLEY, J. H. Tar, smoke and coal gas as factors inimical to vegetation. *Science Progress* 18: 594-596 (1924). 35 references.

SHAW, WILLIAM NAPIER, and OWEN, JOHN S. The smoke problem of great cities. London, Constable, 1925. 301 p. Bibl., p. 29-30, 148-149.

SOAP

FALL, PAUL HENRY. Detergent action of soaps. *J. Phys. Chem.* 31: 848-849 (1927). 93 references.

MCBAIN, JAMES W. Properties of soaps and their aqueous solutions. *International critical tables V*: 460 (1929). 130 references.

MITCHELL, R. A monograph covering the origin, history and significance of the term Castile soap, together with a discussion of the properties, uses, reputation, adulteration and imitation of the product; based upon over 900 extracts from the literature of 400 years. Boston, 1927. 187 p. Autographed from type-written copy.

PROSCH, W. Seifen. *Kolloid-Z.* 45: 279-284 (1928). 43 footnotes.

SODIUM

Natrium. *Gmelin's Handb. anorg. Chem.*, System-Nummer 21. 1928. 992 p. Bibl. through text.

SODIUM ARSENATES. See ARSENATES.

SODIUM CYANIDE *

BERL, E., and BRAUNE, A. Ueber die Darstellung von Natriumcyanid aus Luftstickstoff, Soda und Kohle. *Fortschr. Chem., Phys., physik. Chem.* 18: no. 4. 36 p. 1925. Bibl. footnotes.

SODIUM NITRATE

- EDDELBUEITTEL, H. Chilesalpeter oder synthetischer Natron-Salpeter. *Z. angew. Chem.* 41:509-514 (1928). Bibl., p. 514. 38 references.

SODIUM SILICATES. *See* SILICATES.**SODIUM SULFITE.** *See* POTASSIUM SULFITE.**SOIL**

- BEAR, FIRMAN E. Soil management. 2nd ed. N. Y., Wiley, 1927. 412 p. Bibl. at end of each chapter.
- BURGER, HANS. Physikalische Eigenschaften der Wald- und Freilandböden. Promotionsarbeit, Tech. Hochschule, Zürich, 1923. 221 p. Bibl., p. 219-221.
- BUSWELL, A. M., and NEAVE, S. L. Nitrogen losses through denitrification. *Soil Science* 24:288-290 (1927). 50 references.
- COMBER, NORMAN M. An introduction to the scientific study of the soil. N. Y., Longmans, 1927. 192 p. Bibl., p. 168-176.
- DEMOLON, A. [Soil reaction and its application to agronomy.] *Ann. Sci. Agron. Franç. et Étrangère* (6) 37:97-114 (1920). 44 references.
- DORAN, WILLIAM L. Acetic acid as a soil disinfectant. *J. Agr. Research* 36:279-280 (1928). 27 references.
- EATON, SCOTT V. Sulphur content of soils and its relation to plant nutrition. *Bot. Gaz.* 74:57-58 (1922). 28 references.
- EMERSON, F. V. Agricultural geology. N. Y., Wiley, 1928. 377 p.
- FELDKAMP, CORA L., and PENNINGTON, CATHERINE E. List of publications on soils issued by the state agricultural experiment stations of the United States through 1926. U. S. Dept. of Agr. Library. Bibl. Contributions no. 15. 1927. 81 p. Mimeographed.
- FRED, EDWIN B., and WAKSMAN, SELMAN A. Laboratory manual of general microbiology, with special reference to the micro-organisms of the soil. N. Y., McGraw-Hill, 1928. 145 p. Bibl., p. 137-139.
- HARDY, F. Rôle of aluminium in soil infertility and toxicity. *J. Agr. Sci.* 16:629-631 (1926).
- HAWKS, EMMA B., and TROLINGER, CHARLOTTE. List of the publications on soils issued by the U. S. Department of Agriculture, 1844-1926. U. S. Dept. Agr. Library. Bibl. Contributions no. 14. 1927. 63 p. Mimeographed.
- HECK, A. FLOYD. Study of the nature of the nitrogenous compounds in fungous tissue and their decomposition in the soil. *Soil Science* 29:40-45 (1929). 136 references.
- HUTCHINS, LEE MILO. Studies on the oxygen-supplying power of the soil, together with quantitative observation on the oxygen-supplying power requisite for seed germination. *Plant Physiol.* 1:149-150 (1924).
- JENNY, HANS. Relation of temperature to the amount of nitrogen in soils. *Soil Science* 27:187-188 (1929). 32 references.
- LEROUX, LUCIEN. Les progrès récentes de l'étude des microbes du sol. *Rev. gén. sci.* 36:469 (1925). 34 references.
- LUNDEGARDH, HENRIK. Carbon dioxide evolution of soil and crop growth. *Soil Science* 23:448-449 (1927). 36 references.
- LYONS, T. L. Nitrates in soils as influenced by the growth of plants. *J. Am. Soc. Agronomy* 18:839-840 (1926). 29 references.
- MAIWALD, K. Untersuchungen zur Bestimmung und Deutung des Puffervermögens Karbonatarmer Böden. *Kolloidchem. Beihefte* 27:343-346 (1928). 118 references.
- MARCARD, RENÉ C. L. Contribution à l'étude de l'évolution chimique du soufre employé comme engrais. Thèse, Bordeaux, 1924. 49 p. Bibl., p. 45-49.
- MEYER, FRITZ A. Ueber einige Zusammenhänge zwischen Klima und Boden in Europa. Diss., Technische Hochschule, Zürich, 1926. From *Chemie der Erde* 2:209-347. Bibl., p. 342-347.
- MITSCHERLICH, E. A. Review of German literature on plant nutrition and soil science for 1924. *Soil Science* 20:353-362 (1925). 36 references with abstracts.
- MIYAKE, KOJI, TAMACHI, ISHIO, and KONNO, JUNJIRO. The influence of phosphate, biphosphate, carbonate, silicate and sulphate of calcium, sodium, and potassium on plant growth in acid mineral soils. *Soil Science* 18:294-296 (1924). 60 references.
- ODEN, SVEN. The size distribution of particles in soils and the experimental methods of obtaining them. *Soil Science* 19:31-32 (1925). 41 references.
- PEPIN, J. A. The rôle of calcium in Dunkirk and Volusia soils. *Sci. Agr.* 5:139-154 (1925).
- PRATOLONGO, U. (Studies and researches on soil reaction). *Ann. Inst. Agr. (Milan)* 16:1-128 (1920-1922). 199 references.
- PUCHNER, HEINRICH. *Bodenkunde für Landwirte unter Berücksichtigung*

- der Benutzung des Bodens als Pflanzenstandort, Baugrund und technisches Material. 2. Aufl. Stuttgart, Enke, 1926. 710 p. Bibl. footnotes.
- Review of German literature on soil science and plant physiology in 1925. *Soil Science* 22:213-219 (1926). Abstracts are given.
- SCHARRE, KARL. Beiträge zur Kenntnis der Wasserstoffperoxydzersetzenden Eigenschaft des Bodens. *Landw. Vers. Stat.* 107:183-187 (1928).
- SOCIETY OF CHEMICAL INDUSTRY. Soils and fertilizers. In Reports on the progress of applied chemistry 10:434-451 (1925); 155 footnotes. 11:452-479 (1926); 178 footnotes. 12:454-488 (1927); 187 footnotes. 13:469-506 (1928); 183 footnotes.
- STARKEY, R. L., and HENRICI, A. T. Occurrence of yeasts in soil. *Soil Science* 23:43-44 (1927). 37 references.
- STEWART, HAROLD W. A study of some of the factors affecting the supply of moisture to crops in sandy soils. *Soil Science* 21:215-217 (1926).
- STOKLASA, J., and DOERELL, E. G. Handbuch der biophysikalischen und biochemischen Durchforschung des Bodens. Berlin, Parey, 1926. 812 p. Numerous bibl. footnotes.
- WAKSMAN, S. A. The origin and nature of the soil organic matter or soil "humus." I. Introduction and historical. *Soil Science* 22:123-162 (1926). 251 references.
- WAKSMAN, S. A. Principles of soil microbiology. Baltimore, Williams & Wilkins, 1927. 897 p. Classified list of books for reference in soil microbiology, p. xi-xix. Bibl. footnotes.
- WAKSMAN, S. A. Soil microbiology in 1924: an attempt at an analysis and synthesis. *Soil Science* 19:242-246 (1925). 79 references.
- WAKSMAN, S. A., and DUBOS, R. J. Catalytic power of the soil. *Soil Science* 22:419-420 (1926). 41 references.
- WARNER, MARJORIE F., et al. Classified list of soil publications of the United States and Canada. U. S. Dept. Agr., Library, Bibl. Contributions no. 13. June, 1927. Mimeographed. 549 p. Soil chemistry, p. 173-244.
- WORTHEN, EDMUND L. Farm soils, their management and fertilization. N. Y., Wiley, 1927. 410 p. Bibl. at end of each chapter.
- See also FERTILIZERS.
- SOIL: Alkali.**
- KING, F. B., ERVIN, G., and EVANS, O. L. A bibliography relating to soil alkalies. U. S. Dept. Agr., Bull. No. 1314 (1925). 40 p.
- SAMUELS, CHARLES D. The oxidation of sulfur in alkali soil and its effect on the replaceable bases. Paper no. 157, Univ. of California, Graduate School of Tropical Agr. and Citrus Expt. Sta., Riverside, Calif. 1927. 26 p. Bibl., p. 25-26.
- SOIL: Analysis.**
- AARNIO, BERNHARD, and STREMMER, H. Zur Frage der Bodenbildung und Bodenklassifikation. Suomen geologinen komissioni. Geologiska kommissionen, Finland. *Agrogeologia julkaisuja. Agrogeologiska meddelanden*, no. 17. 1924. 48 p. Bibl. footnotes.
- BENGTTSSON, N. The determination of ammonia in soil. *Soil Science* 18:277-278 (1924). 26 references.
- BURGEVIN, HENRI. Projet de revision de la methode d'analyse physique des terres. *Ann. sci. agron.* 42:482-483 (1925).
- GEDROITS, KONSTANTIN K. Chemische Bodenanalyse. Methoden und Anleitung zur Untersuchung von Boden im Laboratorium. Berlin, Borntraeger, 1926. 245 p. Literatur über die kolorimetrischen Bestimmungsmethoden, p. 204-205.
- KÖHN, MANFRED. Beiträge zur Theorie und Praxis der mechanischen Bodenanalyse. *Landw. Jahrb.* 67:544-546 (1928).
- POWERS, WILBUR L. Studies of sulfur in relation to the soil solution. Univ. of California Publs. in Agric. Sci. 5, no. 4:167-170 (1927).
- SCHILDKNECHT, HERMANN. Die mechanische Bodenanalyse und ihre Anwendung auf die schweizerische kulturtechnische Praxis. Diss., Technische Hochschule, Zürich, 1926. 67 p. Bibl., p. 66-67.
- WAKSMAN, S. A., and STARKEY, ROBERT biologischen Bodenforschung. In Abderhalden, *Handb. biol. Arbeitsm.* XI, pt. 3:715-864 (1927). Bibl. footnotes.
- WAKSMAN, S. A., and STARKEY, ROBERT L. Microbiological analysis of soil as an index of soil fertility. VII. Carbon dioxide evolution. *Soil Science* 17:159-161 (1924). 39 references.
- VAN WIJK, D. J. R. The quantitative determination of nitrates in soil. *Soil Science* 17:177-179 (1924). 39 references.
- SOIL: Organic compounds.**
- CARLSON, F. A. Some relations of organic matter in soils. N. Y., Cornell Univ. Agr. Expt. Sta., Mem. 61, 1922. 27 p. Bibl., p. 25-27. 27 references.

SOIL: Organic compounds—Cont'd

- HILL, HENRY H. Decomposition of organic matter in soil. *J. Agr. Research* 33: 98-99 (1926).
- KEEN, B. A. Some physical and physico-chemical effects of soil organic matter. *J. Am. Soc. Agron.* 19: 368 (1927). 17 references.
- SALTER, F. J. Chemical composition of soil organic matter as related to its effectiveness. *J. Am. Soc. Agron.* 19: 407-409 (1927). 48 references.
- STARKEY, ROBERT L. Some observations on the decomposition of organic matter in soils. *Soil Science* 17: 313-314 (1924). 30 references.
- WAKSMAN, S. A. Origin and nature of the soil organic matter or soil humus. *Soil Science* 22: 152-162 (1926). 251 references.
- WHITING, A. L. Some important factors controlling the rate of nitrification of organic materials. *J. Am. Soc. Agron.* 18: 872-876 (1926). 86 references.

SOIL ACIDITY

- ARRHENIUS, OLOF. Kalkfrage, Bodenreaktion und Pflanzenwachstum. Leipzig, Akad. Verlagsges. m. b. H., 1926. 148 p. Bibl., p. 120-148.
- BRIOUX, CHARLES J. B. Les terres acides. Méthodes de triage. Besoin en chaux et pH. *Ann. sci. agron.* 42: 436 (1925).
- CHRISTENSEN, H. R. The acidity of soils. *Actes de la IV conférence internationale de pédologie, 1924, II*: 515. 40 references.
- CONNOR, S. D., MORGAN, M. F., and CONKEY, G. W. Soil acidity methods as applied to soil survey work. *J. Am. Soc. Agron.* 20: 890-892 (1928). 29 references.
- DULEY, F. L. Easily soluble calcium of the soil in relation to acidity and returns from liming. *Soil Science* 17: 227-228 (1924). 29 references.
- FLEETWOOD, J. ROSS. Easily soluble calcium of soils as an indicator of their response to liming. *Soil Science* 19: 457-458 (1925). 34 references.
- GALLAGHER, P. H. Soil acidity considered from the point of view of base exchange and hydrogen ion concentration. *J. Dept. Agr. Ireland* 28: 102-106 (1929).
- KELLEY, W. P., and BROWN, S. M. Base exchange in relation to alkali soils. *Soil Science* 20: 494-495 (1925). 24 references.
- MEVIUS, WALTER. Reaktion des Bodens und Pflanzenwachstum. Freising, München, Datterer, 1927. 153 p. Bibl., p. 126-153.

- PIERRE, W. H. The H-ion concentration of soils as affected by carbonic acid and the soil-water ratio, and the nature of soil acidity as revealed by these studies. *Soil Science* 20: 304-305 (1925). 27 references.
- SNYDER, EDWARD F. Methods of determining the hydrogen-ion concentration of soils. *U. S. Dept. Agr., Circ. No. 56.* 1928. 30 p. Bibl., p. 26-29.
- TRENEL, MAX. Die wissenschaftlichen Grundlagen der Bodensäurefrage und ihre Nutzenanwendung in der praktischen Landwirtschaft. Berlin, Parey, 1927. 88 p. Bibl., p. 86-88.
- WACKER, F. W. Der Einfluss der Azidität und des Sättigungszustandes der Böden bei Phosphorsäure und Kaliumaufnahme. *Landw. Jahrb.* 67: 626-628 (1928).

SOIL BACTERIA

- SCHARRER, K. Beiträge zur Kenntniss der Wasserstoffperoxyd zersetzenden Eigenschaften des Bodens. *Landw. Vers. Sta.* 107: 183-187 (1928). 76 references.
- WHITTLES, C. L. Determination of the number of bacteria in soil. *J. Agr. Sci.* 13: 39-48 (1923). 225 references.

SOIL COLLOIDS

- ANDERSON, MYRON S., and MATTSON, SANTE. Properties of the colloidal soil material. *U. S. Dept. Agr., Dept. Bull. No. 1452.* 1926. 47 p. Bibl., p. 44-46.
- BOUYOUCOS, GEORGE J. The effect of the colloidal content upon the physical properties of soils. *J. Am. Soc. Agron.* 17: 293-294 (1925). 23 references.
- BRADFIELD, RICHARD. The chemical nature of colloidal clay. *J. Am. Soc. Agron.* 17: 269-270 (1925). 18 references.
- HARDY, F. Anomalous flocculation in colloidal clays and soils. *J. Phys. Chem.* 30: 254-265 (1926). Bibl. footnotes.
- MATTSON, SANTE. Electrodialysis of the colloidal soil material and the exchangeable bases. *J. Agr. Research* 33: 566-567 (1926).
- SALTER, R. M. Climatic agencies in their relation to soil colloids. *J. Am. Soc. Agron.* 17: 305-307 (1925). 80 references.
- TRULLINGER, R. W. Soil colloids and tillage. *Agr. Eng.* 6: 61-63 (1925). 90 references.

SOIL SOLUTION*

- HOAGLUND, D. R. Physiological aspects of soil solution investigations. *Hilgardia* 1: 227-257 (1925). 31 references.

POWERS, WILBUR L. Studies of sulfur in relation to the soil solution. Univ. of California Publs. in Agricultural Sciences 5, no. 4: 167-170 (1927).

SALTER, ROBERT M., and AMES, J. W. Plant composition as a guide to the availability of soil nutrients. J. Am. Soc. Agron. 20: 834-836 (1928). 46 references.

WRANGEL, M. v., and HAASE, W. Ueber den Phosphorsäuregehalt natürlicher Bodenlösungen. Landw. Jahrb. 63: 737-738 (1926). 47 references.

SOLUBILITY

BLASDALE, W. C. Freezing point solubility data for three (or more) component aqueous systems of salts and inorganic compounds. International critical tables IV: 381, 394-395 (1928). 412 references.

BIGGS, T. R. Freezing point solubility data: Three component systems containing a non-metallic elementary substance. International critical tables IV: 270 (1928). 36 references.

BRÖNSTED, J. N. Solubility of salts and of strong acids and bases in water. International critical tables 4: 247-249 (1928). 540 references.

COOLIDGE, A. S. Phase equilibria for three component systems containing two liquid phases, the complete composition of at least one of which is known. International critical tables III: 417 (1928). 130 references.

FERGUSON, JOHN B. Freezing point solubility of systems containing refractory substances. International critical tables IV: 96-97 (1928). 157 references.

FINDLAY, ALEXANDER, and THOMAS, WILLIAM. Freezing point solubility data for three component aqueous systems in which at least one of the two non-aqueous components is either a weak electrolyte or an organic acid, base or non-electrolyte. International critical tables IV: 423 (1928). 146 references.

FOOTE, H. W. Summary of the literature on the solubility of systems related to niter cake. J. Ind. Eng. Chem. 10: 896-897 (1918). 18 footnotes.

HALL, R. E., and SHERRILL, MILES S. Freezing point lowerings of aqueous solutions. International critical tables IV: 263-264 (1928). 298 references.

HILDEBRAND, J. H. Solubility. N. Y., Chem. Cat. Co., 1924. Bibl. footnotes and bibl., p. 200.

HILL, ARTHUR E. Solubilities of liquids in liquids. Two component systems. International critical tables III: 398 (1928). 162 references.

KREMANN, ROBERT. Freezing point-solubility data for non-aqueous systems containing both organic and inorganic compounds. International critical tables IV: 211, 214, 215 (1928). 194 references.

MORTIMER, F. SPENCER. Freezing point solubility data for systems containing organic compounds only. International critical tables IV: 181-183, 184 (1928). 590 references.

PYNE, HERBERT R. A new apparatus for determining gas solubilities; a study of solubility relations in gas-liquid systems. Thesis, Columbia Univ., 1927. 52 p. Bibl., p. 50-52.

RHEINOLDT, H. Bestimmung des Löslichkeit. In Houben-Weyl, Meth. org. Chem. 3rd ed., I: 866-885 (1925). Bibl. footnotes.

RICHARDSON, ALAN H. The solubility of oxygen. An analytical method for the determination of the solubility of oxygen under different conditions. Thesis, Columbia Univ., 1928. 49 p. Bibl., p. 48-49.

SANDONNINI, CARLO, SBORGI, UMBERTO, and AMADORI, MARIO. Freezing point solubility data for two and three component, non-aqueous systems composed of inorganic compounds only. International critical tables IV: 76, 83 (1928). 281 references.

SEIDELL, AHERTON. Solubilities of inorganic and organic compounds. Supplement to second edition. 573 p. N. Y., Van Nostrand, 1928.

Solubilité. In Tables annuelles V: 882-1023 (1917-1922); VI: 846-960 (1923-1926).

TAYLOR, NELSON W. Solubility of organic substances and of weak electrolytes in water. International critical tables IV: 253-254 (1928). 80 references.

TOURNEUX, C. Freezing point solubility data—Systems containing a non-metallic element as one component. International critical tables IV: 38-39 (1928). 178 references.

See also SOLVENTS.

SOLUTION: Heat of.*

ANDERSON, ERNEST. Heats of solution of organic substances. International critical tables V: 160 (1929). 138 references.

SOLUTION: Velocity of.

VAN NAME, R. G. The velocity of dissolving of crystals in liquids. International critical tables V: 60 (1929). 34 references.

SOLUTIONS

EHRET, WILLIAM F. A study of compound formation in systems of two

SOLUTIONS—Cont'd

salts with a common ion in aqueous solution. Thesis, Columbia Univ., 1927. 38 p. Bibl., p. 34-37.

WILKE, E. Beiträge zur Theorie der konzentrierten Lösungen. *Z. physik. Chem.* 121: 401-428 (1926). Bibl. footnotes.

SOLVENTS

JACOBSON, F. Ueber anorganische Lösungsmittel und ihre dissoziierenden Eigenschaften. *Z. kompr. flüss. Gase* 10: 37-42, 53-62 (1906-1907). 92 references, p. 61-62.

MACARDLE, DONALD W. The use of solvents in synthetic organic chemistry. N. Y., Van Nostrand, 1925. 217 p. Bibl., p. 169-193. 908 references.

See also SOLUBILITY; VARNISHES (Heaton).

SORGHUM

PHILLIPS, CAROLINE L. Selected list of references on grain sorghums, grass sorghums, and broom corn. U. S. Dept. of Agr. Bur. of Agr. Economics. *Agr. Economics Bibl.* no. 9. 1925. 9 p. Mimeographed.

PIEDALLU, ANDRÉ. Le sorgho, son histoire, ses applications. Paris, Société d'éditions géographiques, maritimes et coloniales, 1923. 388 p. Bibl., p. 367-383.

See also SUGARS.

SOY BEAN

COLE, LEON J., *et al.* Selection for quality of oil in soy beans. *J. Agr. Research* 35: 94-95 (1927).

DUCCESCHI, VIRGILIO. La soja e l'alimentazione nazionale. Milan, Valardi, 1928. 246 p. Bibl., p. 240-246.

KEMPSKI, KARL E. Die Sojabohne. Geschichte, Kultur und Verwendung unter besonderer Berücksichtigung der Verhältnisse in Niederländisch-Indien. Berlin, Parey, 1923. 88 p. Bibl., p. 76-80.

STARK, ORTON K. The protein metabolism of the soybean. Digest of thesis, Univ. of Illinois, 1926. *Am. J. Bot.* 14: 546-547 (1927).

WEBSTER, JAMES E. Nitrogen metabolism in the soy bean. Thesis, Ohio State Univ., 1928. 38 p. Bibl., p. 35-37.

SPECIFIC HEAT

AWBERRY, J. H., and BARNES, H. T. Heat capacity of chemical compounds in the crystalline and liquid states. *International critical tables V*: 116-117 (1929). 324 references.

Chaleurs spécifiques. *In* *Tables annuelles V*: 74-83 (1917-1922); *VI*: 78-83 (1923-1926).

EASTMAN, E. D. Specific heats of gases at high temperatures. U. S. Bur. Mines, Tech. Paper 445. 1929. 27 p. 90 footnotes.

EITEL, W. Das Nernst'sche Wärmetheorem und seine Bedeutung für mineralogisch-geologische Probleme. *Fortschritte Mineral., Krist. Petr.* 8: 62-68 (1923).

EUCKEN, A. Der Nernst'sche Wärmeersatz. *Ergebnisse der exakten Naturwissenschaften* 1: 162 (1922). 35 references.

LEDUC, A. Heat capacity of gases and vapors. *International critical tables V*: 83-84 (1929). 69 references.

RICHARDS, T. W., and GUCKER, F. T., JR. An improved differential method for the determination of the specific heat of aqueous solutions, including results for various salts and organic acids. *J. Am. Chem. Soc.* 47: 1876-1893 (1925). Bibl. footnotes.

RODEBUSH, W. H., and RODEBUSH, ESTER. Values of the heat capacity, entropy, heat content and "thermodynamic potential" for pure substances between 0° and 298° K. *International critical tables V*: 91 (1929). 36 references.

ROLLA, LUIGI. Heat capacity of alloys, amalgams and intermetallic compounds. *International critical tables V*: 121-122 (1929). 39 references.

ROLLA, LUIGI, and PICCARDI, G. Heat capacity of solid and liquid elementary substances above 0° C. *International critical tables V*: 94 (1929). 95 references.

VANZETTI, B. L. Heat capacity of solutions. *International critical tables V*: 129 (1929). 63 references.

SPECTRAL FILTERS *

GIBSON, K. S. Spectral filters. *International critical tables V*: 273-274 (1929). 49 references.

SPECTROSCOPY

BAUR, E. Kurzer Abriss der Spektroskopie und Kolorimetrie. Leipzig, Barth, 1907. 122 p. Bibl. footnotes.

CARR, EMMA P., and SHERRILL, MARY L. Bibliography of absorption spectra of solutions. *International critical tables V*: 356-358 (1927). 664 references.

DUFFIEUX, M. Sur l'origine de quelques spectres des bandes. *Ann. phys.* (10) 4: 316-318 (1925). 56 references.

GRAMONT, ARMAND DE. Méthodes pratiques d'analyse spectrale pour l'identification des éléments. *Bull. soc. chim.* 33: 1729-1731 (1923). 40 references.

- HAUSEN, H. M., and THORSEN, V. Spectral series of the elements. *International critical tables V*: 406-407 (1929). 329 references.
- VAN DER HARST, P. A. Observations de spectres de l'étain, du plomb, de l'antimoine et du bismuth dans le champ magnétique. *Arch. néerland. sci. II-A*, 9: 16-26 (1925). 182 references.
- HEVESY, G. The use of X-rays for the discovery of new elements. *Chem. Reviews* 3: 329 (1927). 17 references.
- HUND, FRIEDRICH. Linienspektren und periodisches System der Elemente. Berlin, Springer, 1927. 221 p. Bibl., p. 208-217.
- KAYSER, H. Emission spectra of elementary substances. *International critical tables V*: 321-322 (1929). 291 references.
- LANDE, ALFRED. Die neuere Entwicklung der Quantentheorie. 2. Aufl. Dresden, Steinkopff, 1926. 180 p. Bibl., p. 168-175.
- LAUE, M. v. Röntgenstrahl-Spektroskopie. *Ergeb. exakt. Naturwissenschaften* 1: 268-269 (1922). 54 references.
- LÖWE, FRITZ. Atlas der letzten Linien der wichtigsten Elemente. Dresden, Steinkopff, 1928. 44 p. Bibl., p. 15-18.
- LYMAN, THEODORE. Spectroscopy of the extreme ultra-violet. *J. Franklin Inst.* 201: 553-562 (1926). 24 footnotes.
- LYMAN, THEODORE. The spectroscopy of the extreme ultra-violet. N. Y., Longmans, 1928. 160 p.
- MECKE, R. Bandenspektren. *Physik. Z.* 26: 236-237 (1925). 116 references.
- MECKE, R. Bandenspektren und ihre Bedeutung für die Chemie. *Fort. Chem., Physik, physik. Chem.* 20, no. 3. 87 p. 1929. Bibl. footnotes.
- NEGRESO, TR. Evolution de la théorie des spectres. *J. chim. phys.* 25: 142-153 (1928). Bibl. footnotes.
- NEGRESO, TR. Influence des facteurs énergétiques sur la structure des spectres. *J. chim. phys.* 25: 308-319 (1928). Bibl. footnotes.
- SCHIEBE, G. Ueber Fortschritte und Ziehle der Absorptionsspektroskopie. *I. Z. angew. Chem.* 41: 687-690 (1928). 51 footnotes.
- SIEGBAHN, M. Bericht über die letzte Entwicklung der Röntgenspektroskopie. *Jahrb. Radioakt. Elektronik* 21: 241-249 (1921). 172 references.
- SIEGBAHN, M. The spectroscopy of x-rays. *Translated with additions by G. Lindsay*. 287 p. 1925. Chronological bibl., p. 265-285.
- SIEGBAHN, M. *Spektroskopie der Röntgenstrahlen*. Berlin, Springer, 1924. 257 p. Bibl., p. 239-255.
- Spectrophotometry. *J. Opt. Soc. Am.* 10: 235-241 (1925). 130 references.
- Spectroscopy. *In Tables annuelles V*: 367-718 (1917-1922); *VI*: 257-620 (1923-1926).
- SPONER, H. Probleme und Methoden der Vakuumspektroskopie. *Naturwissenschaften* 14: 364 (1926). About 40 references.
- STEINER, PIERRE. Étude spectrographique des alcaloïdes végétaux. L'absorption des rayons ultra-violet par les alcaloïdes des classes de l'isoquinoline et de la morphine. *Bull. soc. chim. biol.* 6: 284-287 (1924). 50 references.
- ZEEMAN, P. Magnetic resolution of spectral lines. *International critical tables V*: 431-432 (1929). 264 references.
- See also ISOTOPES.*
- SPICES**
- MEHRING, A. L. Total ash determination in spices. *J. Agr. Research* 29: 572-574 (1924). 111 references. Classified by variety of spice.
- SPLEEN**
- KRUMBHAAR, E. B. Function of the spleen. *Physiol. Rev.* 6: 191-200 (1926). Classified.
- SPONGE IRON.** *See IRON: METALLURGY.*
- SPONGES ***
- VOSMAER, GUALTHERUS C. J. Bibliography of sponges, 1551-1913. Cambridge, University Press, 1928. 234 p.
- SPUTUM**
- PLESCH, JOHANN. Chemie des Sputums. *In Oppenheimer, Handb. Biochem.* 5: 419-436 (1924). 66 footnotes.
- STAINS: Biological.***
- CONN, H. J. Biological stains. Geneva, N. Y., Comm. Standardization Biol. Stains, 1925. 151 p. Bibl., p. 138-145.
- HOLMES, W. C. Stain solubilities. I. Data in the literature. *Stain Tech.* 2: 44-49 (1927). 20 references.
- See also DYES.*
- STANDARD CELLS**
- EPPLEY, MARION. Standard electrical cells. *J. Franklin Inst.* 201: 17-46 (1926). 81 footnotes.
- See also ELECTROMOTIVE FORCE.*
- STANDARDIZATION ***
- HARRIMAN, NORMAN F. Standards and standardization. N. Y., McGraw-Hill, 1928. 265 p. Bibl., p. 243-247.

STANNIC CHLORIDES

MELLOR, J. W. The stannic chlorides. *In his* Inorg. theor. chem. 7: 450-452 (1927). 350 references.

STANNIC OXIDE

MELLOR, J. W. Stannous oxide and hydroxide. Stannic oxide. The stannic hydroxides. The stannates. *In his* Inorg. theor. chem. 7: 393-394, 401-404, 413-414, 421 (1927). About 750 references.

STANNOUS CHLORIDES

MELLOR, J. W. The stannous chlorides. *In his* Inorg. theor. chem. 7: 434-435 (1927). 250 references.

STARCH

ALSBERG, C. L., and RASK, O. S. On the gelatinization by heat of wheat and maize starch. *Cereal Chem.* 1: 131-132 (1924). 19 references.

BREHMER, W. V., and ZEISEL, S. Stärke. *In* Wiesner, Rohstoffe des Pflanzenreiches, 1989-1998 (1928). 433 references.

CHRSASZEZ, T. Die Bestimmung der Stärke nach der Malzmethode. *Z. Nahr. Genussm.* 48: 306-311 (1924). Bibl. of 10 references.

DALE, JANE E. The influence of salts upon the hydrolysis of starch by pancreatic amylase. Thesis, Columbia Univ., 1925. 28 p. Bibl., p. 25-27.

EYNON, LEWIS, and LANE, J. HENRY. Starch; its chemistry, technology and uses. Cambridge, Eng., Heffer, 1928. 256 p. Bibl. footnotes.

FRITSCH, J. Fabrication de la fécule et de l'amidon d'après les procédés les plus récents. Paris, Legrand, 1925. 422 p. Bibl., p. iv.

LEHRMAN, LEO. The fatty acids in corn starch and synthesis of corn beta amylose palmitate. Thesis, Columbia Univ., 1926. 22 p. Bibl., p. 21-22.

SAMEC, M. Studien über Pflanzenkolloide. *Kolloidchem. Beihefte* 3: 123-160 (1912); 4: 132-174; 5: 141-210 (1914); 6: 23-54 (1914); 7: 137-171 (1915).

SOCIETY OF CHEMICAL INDUSTRY. Sugars, starches and gums. *In* Annual reports on the progress of applied chemistry 10: 452-480 (1925); 123 footnotes. 11: 480-502 (1926); 119 footnotes. 12: 489-511 (1927); 119 footnotes. 13: 507-530 (1928); 119 footnotes.

WALTON, ROBERT P. Starches, 1811-1925. A list of references dealing with the chemistry and technology of starches, dextrines and amylases. *Bull., N. Y. Pub. Lib.* 31: 12-34, 97-140, 178-221, 411-441, 464-523, 572-617, 639-690, 718-787 (1927). 3485

references, subject and author index. *Reprinted* Sept. 1927. 360 p. *Published also* as v. i., pt. 2, of the author's A comprehensive survey of starch chemistry, N. Y., 1928. Classified with author and subject indexes. WIESNER, J. VON, and ZEISEL, S. Stärke. *In* Wiesner, Die Rohstoffe des Pflanzenreiches, II: 1-101 (1918). Bibl. footnotes.

See also CARBOHYDRATES.

STEEL

Bibliography of steel; composition and heat treatment. *Trans. Soc. Automotive Eng.* 8, pt. 2: 41-47 (1913).

BUCK, E. C. Double heat treatment, 1882-1916. *Iron Age* 101: 1658 (1918).

BUREAU OF STANDARDS. Principle of heat treatment of steel. *Trans. Am. Soc. Steel Treating* 14: 904-925 (1928). 211 references.

CROSS, HOWARD C., and HILL, E. E. Density of hot-rolled and heat-treated carbon steels. U. S. Bur. Standards, Sci. Papers no. 562. 1927. Bibl., p. 465-466.

DOWDELL, RALPH LEWIS. Study of the decomposition of the austenitic structure in hardened steels. Thesis, Univ. of Minnesota, 1926. 116 p. A reprint from the *Trans. Am. Soc. Steel Treating*, Jan.-July, 1927. Bibl., p. 108-111.

DUMAS, L. Recherches sur les aciers au nickel. *Ann. mines* (10) 1: 553-555 (1902).

GILLET, H. W., and MACK, E. L. Molybdenum, cerium and related alloy steels. N. Y., Chem. Cat. Co., 1925. 299 p. Bibl., p. 282-292. 323 references with name index.

GRIFFITHS, W. T. Hardening of steel; a review and some comments. *Metalurgist* 2: 89-90 (1926).

GUILLET, LEON, and BALLAY, MARCEL. La fragilité de revenu des aciers. *Rev. métal.* 23: 617 (1926). 36 references.

HARDER, OSCAR E., and DOWDELL, RALPH L. Decomposition of the austenitic structure in steel. *Trans. Am. Soc. Steel Treating* 12: 60-63 (1927).

HATFIELD, W. H. The application of science to the steel industry. *Trans. Am. Soc. Steel Treating* 15: 474-502, 652-669, 817-836, 986-1026 (1929). 129 references.

HERMANN, HUBERT. The planning, erection and operation of modern open hearth steel works. London, Benn, 1924. 307 p. Bibl. of the open hearth process, p. 289-301.

HERMANN, HUBERT. Bau und Betrieb moderner Konverterstahlwerke und

- Kleinbesemereien; eine Darstellung der metallurgischen Hilfsmittel der Stahlerzeugung nach dem Bessemer-Verfahren. 1925. Bibl., p. 232-247.
- HEYN, EMIL. Die Theorie der Eisen-Kohlenstoff-Legierungen. Berlin, Springer, 1924. Bibl., p. vi-viii.
- KEENEY, R. M. Production of steels and ferro-alloys directly from ore in the electric furnace. *J. Iron and Steel Inst. Carnegie School Mem.* 4: 183-184 (1912).
- KERPELY, K. Siliziumstahl als Baustahl und Stahlformguss. Halle, Knapp, 1927. 41 p. Bibl., 1 p. at end.
- MCCLELLAND, E. H. Books on the heat treatment of steel. *Forging-Stamping-Heat Treating* 13: 369-371 (1927). 58 references. Annotated. Reprinted by Carnegie Lib. Pittsburgh. 1928. 12 p.
- MCCLELLAND, E. H., and POLANSKY, VICTOR S. Manganese steel. A bibliography. Carnegie Lib. of Pittsburgh, 1926. 60 p. Blast Furnace and Steel Plant 14: 361-364, 386-389, 410 (1926); in part in *Forging-Stamping-Heat Treating* 11: 49-53 (1925).
- MCINTOSH, F. F., and COCKRELL, WAYNE L. The effect of phosphorus on the resistance of low-carbon steel to repeated alternating stresses. *Carnegie Inst. Tech., Mining Met. Investigations, Bull.* 25. 31 p. Bibl., p. 29-31.
- MATHEWS, JOHN A. Austenite and austenitic steels. *Trans. Am. Inst. Min. Met. Eng.* 71: 568-596 (1925). 14 footnotes.
- MUSATTI, I., and CROCE, M. Sull'influenza dell'azoto dei cementi azotati nel processo di cementazione degli acciai. *Ann. chim. appl.* 14: 18-59 (1924). 39 footnotes.
- OBERHOFFER, P., HESSENBRUCH, W., and ESSER, H. Die Rolle des Sauerstoffes für die Metallurgie und die Qualität des Stahls. *Z. Ver. deut. Ing.* 71: 1569-1576 (1926). 37 footnotes.
- PINKERTON, D. J. Research: a review of 21 years progress, 1892/1913. *J. West Scotland Iron Steel Inst.* 21: 27-41 (1914). 216 references.
- POLANSKY, VICTOR S. Seamless steel tubing; a bibliography. Blast Furnace and Steel Plant 15: 88-91, 133-136, 180-182, 192, 480-481, 534-535 (1927); 16: 630-633, 919-921, 925 (1928). Reprinted by Carnegie Lib. Pittsburgh. 1928. 78 p.
- RAPATZ, FRANZ. Die Edelmstähe: ihre metallurgischen Grundlagen. 1925. Bibl. footnotes.
- Report on the heterogeneity of steel ingots. *J. Iron Steel Inst.* 113: 113-151 (1926). 259 references.
- SASAGAWA, K. Recherche sur les aciers à coupe rapide avec et sans cobalt. *Rev. Métal.* 22: 106 (1925). 27 references.
- SAWYER, C. BALDWIN. The reactions and effects of nitrogen on steel. A supplementary review of literature. *Trans. Am. Soc. Steel Treating* 8: 291-308 (1925). 60 footnotes.
- SCHAEFER, R. Die Konstruktionsstähle und ihre wärme Behandlung. Berlin, Springer, 1923. 370 p. Bibl. footnotes.
- WHITE, ALBERT E., and CLARK, CLAUDE L. Properties of ferrous metals at elevated temperatures. Dept. of Eng. Res., Univ. of Michigan. Reprint ser. no. 3. February, 1928. 16 p. Bibl., p. 16.
- See also IRON: ALLOYS.
- STEEL: Analysis.**
- GALLO, G. Contribution to the analysis of iron products. Analytical methods and notes. *Rass. misc.* 26: 165-168, 185-186, 200-203, 216-218, 235-237, 248-250. Bibl. of authorities.
- MEYER, OSKAR. Ueber den heutigen Stand der Bestimmung von Sauerstoff in Stahl und Eisen. *Z. angew. Chem.* 41: 1273-1276, 1295-1298 (1928). 49 footnotes.
- MUELLER, E., and DIETHEL, M. Bestimmung des Kohlenstoffs und Schwefels in den hochprozentigen Legierungen des Wolframs, Molybdäns und Vanadiums mit Eisen. *Z. angew. Chem.* 23: 2123-2124 (1910). 79 references.
- STEEL: Stainless.**
- MONYPENNY, J. H. G. Stainless iron and steel. Chapman, 1926. Contains bibl. footnotes. Concerned mainly with chromium steels.
- WHITE, ALBERT E., and CLARK, CLAUDE L. Stainless steel; a digest with abstracts and bibliography. Dept. of Eng. Res., Univ. of Michigan. Eng. Res. Bull. no. 4. 1926. 82 p. 132 references.
- STEEL: Testing.**
- CLARK, CLAUDE L., and WHITE, ALBERT R. The stability of metals at elevated temperatures. Univ. Mich., Dept. of Eng. Research, Eng. Research Bull. no. 11. 1928. 122 p. Bibl. for 1925-1928, p. 97-103.
- DEFOREST, A. V. Use and development of magnetic analysis in the U. S. Congrès intern. pour l'essai des matériaux, 1927: 499-500. 34 references, covering 1914-1917.

STEEL: Testing—Cont'd

DÖHMER, P. WILHELM. Die Brinellsche Kugeldruckprobe und ihre praktische Anwendung bei der Werkstoffprüfung in Industriebetrieben. Berlin, Springer, 1925. 186 p. Bibl., p. 177-183.

GREAVES, R. H., and JONES, J. A. Effect of temperature on the behavior of iron and steel in the notched-bar impact test. *J. Iron Steel Inst.* 112: 160-162 (1925).

GROESBECK, EDWARD C. Metallographic etching reagents. III. For alloy steels. *U. S. Bur. Standards. Sci. Papers* no. 518. 1925. Bibl., p. 584-586.

STEREOCHEMISTRY

COOPS, JAN. De stereoïsomerie der wijnsteenzuren in verband met de complexvorming met boorzuur. 179 p. Proefschrift, Amsterdam, 1924. Bibl. footnotes.

LEVENE, P. A. The configuration relationships of the sugars, hydroxy acids, amino acids and the halogen acids. *Chem. Reviews* 2: 215-216 (1925). 29 references.

WALDEN, P. Vergangenheit und Gegenwart der Stereochemie. *Naturwissenschaften* 13: 301-312; 331-336; 352-359; 376-384 (1925). Bibl. footnotes; references through text.

STERIC HINDRANCE *

ANSCHÜTZ, L. Ueber das Wesen der sterischen Hinderung. *Z. angew. Chem.* 41: 691-692 (1928). 54 footnotes.

STIBINE

MELLOR, J. W. The antimony hydrides. *In his Inorg. theor. chem.* 9: 400-401 (1929). 100 references.

STRONTIUM *

BURR, MAY S. Strontium and its compounds. *In* Friend, *Textbook inorg. chem.* III, pt. I: 151-195 (1925). Bibl. footnotes.

PIVA, AGIDE. L'industria die sali di stronzio e la preparazione tecnica del carbonato dalla celestina per via umida. *Giorn. chim. ind. appl.* 5: 279-284 (1923). 42 footnotes.

STRONTIUM ARSENATES. *See* ARSENATES.

STRONTIUM SILICATES. *See* SILICATES.

STRONTIUM SILICIDES. *SILICIDES.*

SUBLIMATION

KEMPF, RICHARD. Sublimieren. *In* Houben-Weyl, *Meth. org. Chem.* 3rd ed., I: 663-707 (1925). Bibl. footnotes.

SUGAR BEET

HILDEBRANDT, ALFRED. Die Entwicklung des deutschen Zuckerrübenbaues mit besonderer Berücksichtigung der Ackerbautechnik. *Inaug.-Diss.*, Berlin, 1928. 112 p. Bibl., p. 107-112.

ROEMER, THEODOR. Handbuch des Zuckerrübenbaues. Berlin, Parey, 1927. 366 p. Bibl. at end of sections.

TOTTINGHAM, WILLIAM E., *et al.* Climatic effects in the metabolism of the sugar beet. *J. Agr. Research* 33: 75-76 (1926).

SUGARS

BARTSCH, G. Die jetzige Art der Dicksaftherstellung. *Deut. Zuckerind.* 50: 747-751 (1925). Bibl. footnotes.

BATES, FREDERICK, PHELPS, F. P., and SNYDER, C. F. Saccharimetry, the properties of commercial sugars and their solutions. *International critical tables* II: 355 (1927). 97 references.

CRAMER, MARC. Les sucres et leurs dérivés. Paris, Doin, 1927. 353 p. Bibl. of 32 p.

FAIRRIE, GEOFFREY. Sugar. Liverpool, Fairrie & Co. Ltd., 1925. 233 p. Bibl., p. 225-226.

GUNDERMANN, E. Die Arbeiten und Entwicklung der Zuckerindustrie auf maschinell und apparativem Gebiet. *Chem. App.* 15: 27-28, 62-63, 85-86, 114-115, 125-126, 220-222, 254-257, 266-268 (1928); 16: 4-5 (1929). Bibl. through text.

HEIDELBERGER, MICHAEL. Immunologically specific polysaccharides. *Chem. Reviews* 3: 423 (1927). 31 references.

KOLFF, GERARD H. VAN DER. Bevolkingsrietcultuur in Nederlandsch-Indië een landbouweconomische studie). Proefschrift, Wageningen, 1925. 288 p. Bibl., p. 265-288.

LEIBOWITZ, J. Die Entwicklung der Zuckerchemie in den letzten zwei Jahren. *Z. angew. Chem.* 39: 1143-1148, 1240-1248 (1926). 122 references.

PRINGSHEIM, HANS. Zuckerchemie. Leipzig, Akademische Verlagsgesellschaft, 1925. 322 p. Bibl., 2d p. after p. x.

PRINSEN GEERLIGS, H. C. Zuckerrohr. Hamburg, Bangert, 1925. 123 p. Bibl., p. 122-123.

SCHIEBEL, KARL. Wärmewirtschaft in der Zuckerindustrie. Dresden, Steinkopff, 1926. 174 p. Bibl., p. 170-171.

SPENGLER, O. Fortschritte der Rübenzuckerindustrie seit 1924. *Z. angew. Chem.* 41: 194-200 (1928). 149 footnotes.

TAYLOR, ALEXANDER J. W. Sugar machinery: a descriptive treatise devoted

to the machinery and processes used in the manufacture of cane and beet sugars. Rider, 1924. Bibl. of sucrose, p. 398-400.

THIEME, JOHANN G. Studies on sugar boiling. N. Y., Facts about Sugar, 1928. 116 p. Bibl. p. 113-116.

ZERBAN, F. W. Bibliography on sampling saccharin products. J. Assoc. Off. Agr. Chem. 10: 97-98 (1927). 7 references.

See also CARBOHYDRATES and names of individual sugars.

SULFARSENATES. See ARSENIC SULFIDES.

SULFARSENITES. See ARSENIC SULFIDES.

SULFARSPHENAMINE. See ARSPHENAMINE.

SULFIDE ENRICHMENT *

TOLMAN, C. F., JR. Recent advances in the study of sulphide enrichment. Min. Sci. Press 108: 174-176 (1914). 25 references. Annotated.

TOLMAN, C. F., JR. Secondary sulphide enrichment of ores. Min. Sci. Press 106: 180-181 (1913). 61 references.

SULFIDES *

DOELTER, C., and LEITMEIER, H. Schwefel-Verbindungen. In Doelter, Handb. Mineralchem. 4, pt. 1. Dresden, Steinkopff, 1926. 1003 p. Bibl. footnotes.

SCHNEIDERHÖHN, HANS. Die Oxydations- und Zementationszone der sulfidischen Erzlagertstätten. Fortschr. Mineral., Krist., Petr. 9: 155-160 (1924). 133 references.

See also name of individual elements.

SULFITE WASTE LIQUORS. See PAPER.

SULFOARSENIDES. See ARSENIC SULFIDES.

SULFUR

HIMMELBAUER, ALFRED. Schwefel. In Doelter, Handb. Mineralchem. IV, pt. 1: 1-28 (1926). Bibl. footnotes.

LOTTERMOSER, A. Kolloidchemie des Schwefels. In Abegg, Handb. anorg. Chem. 4, pt. 1, 1st half: 667-668 (1927). 80 references.

STEINWEHR, H. V., *et al.* Schwefel und seine Verbindungen. In Abegg, Handb. anorg. Chem. 4, pt. 1, 1st half: 586-628 (1927). 1908 references.

SULFUR: Organic compounds.*

KAUFMANN, H. P. Synthese schwefelhaltiger Verbindungen. Arch. Pharm. 267: 192-211 (1929). 28 footnotes.

STEINKOPFF, WILHELM. Organische Schwefelverbindungen. In Houben-Weyl, Meth. org. Chem. 2nd ed., III: 926-1012 (1923). Bibl. footnotes.

SULFURIC ACID

CARPENTER, CLIFFORD E., and LEHRMAN, ALEX. The solid-liquid temperature relation in the ternary system H_2SO_4 - HNO_3 - H_2O and its relation to the ternary system Na_2O - H_2O - SO_3 . Trans. Am. Inst. Chem. Eng. 17: 72-73 (1926). 53 references.

DE JUSSIEU, —. Evolution de la fabrication de l'acide sulfurique par le procédé des chambres de plomb dans les dernières années. Paris, L'Industrie Chimique, 1928. 457 p. This work is a compilation—an elaborated bibliography—of publications on the subject treated during the limited period covered.

See also ACIDS, ALKALIS, SALTS (Waeser); CHEMICAL EQUILIBRIUM.

SUNFLOWER-SEED OIL *

FRENCH, HERBERT E., and HUMPHREY, H. O. Experiments on sunflower-seed oil. Univ. of Missouri Bull. v. 27, no. 7. Eng. Expt. Sta. Ser. no. 25. 1926. 27 p. Bibl., p. 26-27. 49 references.

SUPRARENALS

GOLDZIEHER, MAX A. The adrenals; their physiology, pathology and diseases. N. Y., Macmillan, 1929. 436 p. Bibl., p. 323-420.

See also ADRENALINE.

SURFACE TENSION

ADAM, NEIL K. The properties of surface films on liquids. Chem. Reviews 3: 196-197 (1926). 46 references.

ADAM, NEIL K. Surface tension. Sci. Prog. 21: 446-447, 640 (1927). 56 references.

BARTELL, F. E., and OSTERHOF, H. J. The measurement of adhesion tension solid against liquid. Colloid symposium monograph 5: 113-134 (1928). 30 footnotes.

BOTTAZZI, F. L. Surface tension of colloids with special reference to protein colloids. In Alexander, Colloid chemistry II: 121-163 (1928). 74 footnotes.

CENTNERSZWER, M., and STRAUMANIS, M. Die Ueberspannungen des Wasserstoffs an fein verteilten Metallen und ihr Zusammenhang mit der katalytischen Wirkung der Metalle auf die Auflösung des Zinks. Z. physik. Chem. 118: 438-446 (1925). Bibl. footnotes.

DORSEY, N. ERNEST. Measurement of surface tension. U. S. Bur. Standards, Sci. Paper 540; Bull. 21: 563-595 (1926). Bibl. of 110 references, p. 592-595.

DUBRISAY, RENÉ. Les actions de surface dans les phénomènes chimiques.

SURFACE TENSION—Cont'd

Bull. soc. chim. 43: 639-641 (1928).
About 80 references.

HARKINS, WM. D. Surface energy and surface tension. *In* Alexander, Colloid chemistry 1: 264 (1926). 60 references.

DUNOÛY, P. L. Surface equilibria of biological and organic colloids. N. Y., Chem. Cat. Co., 1926. 212 p. Bibl. footnotes; bibl., p. 195-202.

REHBINDER, P. Wasser als oberflächenaktiver Stoff. *Z. physik. Chem.* 121: 103-126 (1926). Bibl. footnotes. Tension superficielle. *In* Tables annuelles V: 63-73 (1917-1922); VI: 74-77 (1923-1926).

YOUNG, T. FRAZER, HARKINS, WM. D., *et al.* Properties of surfaces. International critical tables IV: 434, 435, 439, 440, 442, 446, 463, 475, 477 (1928). 348 references.

ZUNZ, EDGARD. The modifications of dynamic surface tension of plasma and serum. *In* Alexander, Colloid chemistry II: 651-684 (1928). 84 footnotes.

ZUNZ, EDGARD. Recherches sur les modifications de la tension, superficielle dynamique du plasma et du serum. *Ergeb. Physiol.* 24: 445-448 (1925). 80 references.

See also CAPILLARITY; FLOTATION.

SWEETENING AGENTS*

HERZOG, WALTHER. Berichte über die Fortschritte auf dem Gebiete der synthetischen Süsstoffe und verwandten Verbindungen in den Jahren 1923 und 1924. *Z. angew. Chem.* 38: 641-648 (1925). 59 references. 1925-1926. Fortschrittsber. Chem.-Ztg. no. 2: 66-68 (1927). 47 footnotes.

See also SUGARS.

SYNTHALIN. See DIABETES (Wolff).**TALC**

KOSTVILEVA, E. (Talc and soapstone). Contributions to the study of the natural resources of the U. S. S. R., No. 52: 1-101 (1925). Contains an extensive bibl.

LADOO, R. B. Talc (Steatite). *In* his Non-metallic minerals 628 (1925). 13 references.

SPENCE, H. S. Talc and soapstone in Canada. Canada, Mines Branch, 1922. 85 p. Bibl., p. 77-78.

STODDARD, B. H. Talc and soapstone. U. S. Geol. Surv., Mineral Resources, 1923, II: 165. 7 references.

WILSON, MORLEY E. Talc deposits of Canada. Canada. Geol. Surv., Economic geol. ser., no. 2. 1926. 149 p. Bibl. footnotes.

See also MAGNESIUM SILICATES.

TANNIC ACID AND TANNINS

BREHMER, W. V., and KONSTANTY, E. Gerbstoffe. *In* Wiesner, Rohstoffe des Pflanzenreiches 1: 937-946 (1927). 491 references.

BURTON, D. Chrome tanning. *J. Am. Leather Chemists' Assoc.* 21: 33-36 (1926); 23: 45-50, 636-641 (1928); *J. Inst. Soc. Leather Trades Chemists* 9: 383-385 (1925); 12: 337 (1928).

CARRARA, GINO. Recenti sviluppi nella chimica della sostanze concianti naturali. *Giorn. chim. ind. appl.* 7: 466-471 (1925). 47 footnotes.

COGHILL, D. A survey of the tanning materials of Australia. Australia, Council for Sci. Ind. Research, Bull. No. 32. 1927. 136 p. Bibl., p. 134-136.

ESCOURROU, R. Les produits tannants dérivés de la fabrication de la cellulose du bois. *Chimie et industrie, Spécial No.*, April, 1928: 623. 68 footnotes.

FREUDENBERG, K. Die Gerbstoffe. *In* Houben-Weyl, *Meth. org. Chem.*, 2nd ed., III: 753-788 (1923). Bibl. footnotes.

FREY, R. W. Bibliography on sampling tanning materials and leathers. *J. Assoc. Off. Agr. Chem.* 10: 96-97 (1927). 10 references on tanning and 34 on leather.

FRIEDENTHAL, HANS W. K. Die Mineralgerbung; die Herstellung von mineralgegerbtem Leder für alle Lederarten von der Rohhaut bis zum fertigen Produkt. Berlin, Krayn, 1925. 128 p. Bibl., p. 118-123.

GERNGROSS, O. Fortschritte auf dem Gebiete der Gerberei-Chemie und -Technik. *Z. angew. Chem.* 41: 221-226, 254-262 (1928). 290 footnotes.

GNAMM, HELLMUT. Die Gerbstoffe und Gerbmittel. Stuttgart, Wissenschaftliche Verlagsgesellschaft g. m. H. 1925. 394 p. Bibl. footnotes.

GUSTAVSON, K. H., and WIDEN, P. J. Reaction between chrome liquors and hide substance. *Ind. Eng. Chem.* 17: 583 (1925). 17 references.

LI, YUN HUA. A theory of tanning. *J. Am. Leather Chem. Asso.* 22: 380-444 (1927). 115 footnotes.

MCGOOKIN, ALEX., and HEILBRON, I. M. Tannins occurring in the kino of *Eucalyptus calophylla*. *J. Pharmacol.* 26: 441-446 (1926). 283 references.

SANDER, G. Kolloidchemie in der Gerberei. *Kolloid-Z.* 48: 96-103 (1929). 77 references.

SPIERS, C. H. The one-bath chrome tanning process in the light of Werner's coordination theory. *J. Am.*

Leather Chem. Assoc. 24: 246-269 (1929). 66 footnotes.

Tanning materials. Bull. Imp. Inst. 26: 311-322 (1928).

WOLESENSKY, EDWARD. Investigation of synthetic tanning materials. U. S. Bur. Standards. Tech. Papers no. 302. 1925. 27 p. Bibl., p. 44-45.

See also DYES (Doyle); LEATHER.

TANTALUM

EPHRAIM, F., and KROLL, H. Tantal. In Gmelin-Kraut, Handb. anorg. Chem., VI, pt. I: 276-333, 912-949 (1928). Bibl. through text.

MELLOR, J. W. Tantalum. In his Inorg. theor. chem. 9: 883-925 (1929). Bibl. through text.

TARTARIC ACID

BARRETT, HAROLD J. The conversion of fumaric and maleic acids into tartaric acid. Thesis, Ohio State Univ., 1927. 34 p. Bibl., p. 29-33.

TARTRATES.* See POTASSIUM: PHYSIOLOGICAL.

TASTE

COHN, G. Die organischen Geschmacksstoffe. Berlin, Siemenroth, 1914. 936 p. Bibl. footnotes.

TAUTOMERISM

LOWRY, T. M. Static and dynamic isomerism in prototropic compounds. Chem. Reviews 4: 252-253 (1927). 27 references.

TEA

DUTCH EAST INDIES. *Proefstation voor thee*. Gedenkboek der Nederlandsch Indische theecultuur 1824-1924; uitgegeven door het Proefstation voor thee bij gelegenheid van het Theecongres met tentoonstelling, Bandoeng 1924. Weltevreden, Kolff, 1924. 241 p. "Bibliografie der Ned.-Ind. theecultuur 1824-1924 door Dr. C. P. Cohen Stuart," p. 198-241.

KEMPSKI, KARL E. Die Teekultur unter besonderer Berücksichtigung der Verhältnisse in Niederländisch-Indien. Berlin, Parey, 1923. 59 p. Bibl., p. 52-55.

MACLAREN, W. A. Rubber, tea and cacao. London, Benn, 1924. 334 p. Bibl., p. 323-326.

NEUVILLE, HENRI. Technologie du thé. Composition chimique de la feuille, récolte et manipulation, procédés européens-procédés asiatiques. 2éd. Paris, Société d'éditions géographiques, maritimes et coloniales, ancienne Maison Challamel, 1926. 304 p. Index bibl., p. 277-300.

See also BEVERAGES.

TEETH

MELLANBY, MAY. The influence of diet on the structure of teeth. Physiol. Rev. 8: 575-577 (1928). 85 references.

TREBITSCH, F. Ueber den Fluorgehalt der Zähne. Biochem. Z. 191: 240 (1927).

TELLURIUM

LOTTERMOSER, A. Kolloidchemie des Tellurs. In Abegg, Handb. anorg. Chem., 4, pt. 1, 1st half: 936 (1927). 15 references.

MEYER, JULIUS. Atomgewicht des Tellurs. In Abegg, Handb. anorg. Chem., 4, pt. 1, 1st half: 860-863 (1927). 125 references.

MEYER, JULIUS. Tellur. In Abegg, Handb. anorg. Chem. 4, pt. 1, 1st half: 918-928 (1927). 386 references.

SLAVIK, F. Tellur und seiner Verbindungen. In Doelter, Handb. Mineralchem. 4, pt. 1: 845-894 (1926). Bibl. footnotes.

See also SELENIUM.

TEMPERATURE: Physiological effect*

SAYERS, ROYD R., and DAVENPORT, SARA J. Review of literature on the physiological effects of abnormal temperatures and humidities. 63 p. Reprint no. 1150 from the Public Health Repts. 42: 933-996; 1927. Bibl., p. 58-63.

TERRA COTTA *

WILSON, HEWITT. Terra cotta. Bull. Am. Ceram. Soc. 5: 137-145 (1926). 173 references. Classified.

See also CERAMICS.

TETANY

MACCALLUM, W. G. On the pathogenesis of tetany. Medicine 3: 155-163 (1924). Classified.

TETRANITROANILINE *

FLUERSCHEIM, B. J. Some properties of tetranitroaniline. J. Soc. Chem. Ind. 40: 97-107 (1921). 120 footnotes.

TEXTILES

U. S. Bureau of Foreign and Domestic Commerce. Government publications relating to textiles. Washington, Govt. print. off., 1928. 52 p.

See also BLEACHING; COTTON; DYEING; FIBERS; RAYON; SILK; ETC.

THERMAL CONDUCTIVITY

BARRETT, T., and NETTLETON, H. R. Thermal conductivity of liquids and solids. International critical tables V: 226, 229, 230, 233 (1929). 284 references.

Conductibilité thermique. In Tables annuelles V: 84-87 (1917-1922); VI: 84-85 (1922-1926).

THERMAL CONDUCTIVITY—Cont'd

LABY, T. H., and NELSON, E. A. Thermal conductivity of gases and vapors. International critical tables V:215 (1929). 49 references.

RICE, CHESTER W. Free and forced convection of heat from bodies of simple shape in gases and liquids. International critical tables V:236 (1929). 125 references.

SCHULZ, KARL. Die Wärmeleitung in Mineralien, Gesteinen und den künstlich hergestellten Stoffen von entsprechender Zusammensetzung. Fortschr. Mineral. Kryst. Petr. 9:396-411 (1924). About 450 references.

VAN DUSEN, M. S. Thermal conductivity of non-metallic solids. International critical tables V:217 (1929). 53 references.

THERMAL EXPANSION

CLARK, J. S. Thermal expansion including volume change on fusion, solidification and tempering. International critical tables II:477-478 (1927). 143 references.

Coefficients de dilatation. *In* Tables annuelles I:44-48 (1910); II:38-42 (1911); III:49-50 (1912); IV:133-138 (1913-1916); V:10-19 (1917-1922); VI:19-24 (1923-1926).

THERMOCHEMISTRY

BICHOWSKY, F. RUSSELL. Thermochemistry. International critical tables V:207-211 (1929). 1113 references.

Calorimétrie et thermochimie. *In* Tables annuelles V:1024-1040 (1917-1922); VI:86-98 (1923-1926).

MARCHAL, GERMAINE. Recherches sur le décomposition des sulfates métalliques par la chaleur. J. chim. phys. 22:325-348 (1925). Bibl. footnotes.

ROTH, W. A. Fortschritte auf dem Gebiet der Thermochemie. Z. angew. Chem. 41:397-401 (1928). 37 footnotes.

WÜST, J., and LANGE, E. Lösungs- und Verdünnungswärmen von Salzen von der äussersten Verdünnung bis zur Sättigung. I. Alkalihalogenide: KCl, KBr, KI, NaCl, NaBr, NaI. Z. physik. Chem. 116:161-214 (1925). Bibl. footnotes.

THERMODYNAMICS

FABRY, CHARLES. Éléments de thermodynamique. Paris, Colin, 1928. 216 p. Bibl., p. 207-208.

ONNES, H. KAMERLINGH, and KEESOM, W. H. Die Zustandsgleichung. *In* Encyklopaedie der mathematischen Wissenschaften V, pt. I:615-945 (1912). 1125 footnotes. Bibl., p. 620-622.

Thermodynamique. *In* Tables annuelles V:88-103 (1917-1922); VI:99-111 (1923-1926).

THERMOELECTRICITY *

GALIBOURG, J. Thermo-électricité des métaux et alliages. Rev. métal. 22:626-630 (1925). 78 references.

THERMOSTATS *

HOUGEN, OLAF A., and RAGATZ, ROLAND A. Laboratory methods for producing and maintaining constant temperatures above 0° C. International critical tables I:66 (1926). 46 references.

KANOLT, C. W. Laboratory methods for producing and maintaining constant temperatures below 0° C. International critical tables I:62 (1926). 42 references.

THIOCARBAMIC ACID *

MELLOR, J. W. The thiocarbamic acids and the thiocarbamates. *In* his Inorg. theor. chem. 6:134 (1925). About 30 references.

THIOCARBONIC ACID *

MELLOR, J. W. The thiocarbonic acids and the thiocarbonates. *In* his Inorg. theor. chem. 6:129-130 (1925). About 60 references.

THIOCARBONYL CHLORIDE. *See* CARBON SULFIDES.

THIONYL CHLORIDE

SILBERRAD, C. A. Thionyl chloride. J. Soc. Chem. Ind. 45:57 (1926). 145 references.

THIOPHOSGENE. *See* CARBON SULFIDES.

THORIUM

GUHLER, HERMANN. Thorium. *In* Gmelin-Kraut, Handb. inorg. Chem. VI, pt. 1:68-191, 802-881 (1928). Bibl. through text.

MELLOR, J. W. Thorium. *In* his Inorg. theor. chem. 7:174-253 (1927). History and occurrence, 180; extraction, 110; radioactivity, 300; preparation and properties, 300; incandescent mantle, 100 references.

MEYER, R. J. Bibliographie der seltenen Erden. Ceriterden, Yttererden und Thorium. 79 p. 1905.

THORIUM CHLORIDES *

MELLOR, J. W. Thorium chlorides. *In* his Inorg. theor. chem. 7:236 (1927). 100 references.

THORIUM OXIDES *

MELLOR, J. W. Thorium oxides and hydroxides. *In* his Inorg. theor. chem. 7:225-227 (1927). 175 references.

THORIUM SILICIDES. *See* SILICIDES.

THROMBASE

OPPENHEIMER, CARL. Thrombase. *In his* Die Fermente, 1140-1209 (1926). 332 footnotes.

See also ENZYMES.

THYMUS*

PERITZ, GEORG. Der Thymus. *In* Oppenheimer, Handb. Biochem. 2nd ed., 9:305-328 (1926). 120 footnotes.

THYROID

BOOTHBY, WALTER M., SANDIFORD, IRENE, SANDIFORD, KATHLEEN, and SLOSSE, JEAN. The effect of thyroxine on the respiratory and nitrogenous metabolism and myxedematous subjects. I. A method of studying the reserve or deposit protein with a preliminary report of the results obtained. *Ergeb. Physiol.* 24:728-729 (1925). 45 references.

HIRSCH, RAHEL. Thyreoidea. *In* Oppenheimer, Handb. Biochem. 2nd ed., 9:229-255 (1925). 94 references.

KENDALL, EDWARD C. Thyroxine. N. Y., Chem. Cat. Co., 1929. 265 p. Bibl., p. 230-253. 541 references.

KENDALL, EDWARD C., and SIMONSEN, D. G. Seasonal variations in the iodine and thyroxine content of the thyroid gland. *J. Biol. Chem.* 80:376-377 (1928). 27 references.

LÖHR, HANS. Ueber die Wirkung des Thyroxins auf dem menschlichen Organismus. *Z. ges. exptl. Med.* 53:629-631 (1927). 97 references.

TIGLIC ACID*

TALBOT, HENRY P. An index to the literature of angelic and tiglic acids from 1842-1892. *Tech. Quart.* 5:80-103 (1892). 85 references. Literature discussed in text.

TIN

JONES, WILLIAM R. Tinfields of the world. London, Mining Publs., Ltd., 1925. 423 p. Bibl., p. 382-407.

MANTELL, C. L. Corrosion of tin and its alloys. *Am. Inst. Min. Met. Eng., Tech. Pub. no. 171.* 1929. 38 p. 100 footnotes.

MELLOR, J. W. Tin. *In his* Inorg. theor. chem. 7:276-483 (1927). Bibl. through text. History, 150; occurrence, 175; extraction, 300; physical properties, 1,000; chemical properties, 600 references.

See also MINERAL RESOURCES.

TIN: Alloys.

MELLOR, J. W. The alloys of tin. *In his* Inorg. theor. chem. 7:344-386 (1927). Alkali metals, 30; copper, 900; silver and gold, 100; alkaline earths, 325; aluminium, indium,

thallium and chromium, 100 references.

See also ALLOYS.

TITANATES*

MELLOR, J. W. The titanates. *In his* Inorg. theor. chem. 7:60-63 (1927). 350 references.

TITANIUM

MARZANO, CHRISTOPHER. Titania jellies. Thesis, Catholic Univ. of America, 1925. 37 p. Bibl., p. 36-37.

MELLOR, J. W. Titanium. *In his* Inorg. theor. chem. 7:1-97 (1927). Discovery, 25; occurrence, 225; extraction, 40; preparation, 150; physical properties, 200; chemical properties, 200 references. References to salts through text.

SUIROKOMSKII, V. S. (Titanium and its application in the industries). Contributions to the study of the natural resources of the U. S. S. R. No. 56, Titanium and its compounds, No. 1:76-108 (1926). Contains bibls.

THORNTON, WILLIAM MYNN, JR. Titanium, with special reference to the analysis of titaniferous substances. N. Y., Chem. Cat. Co., 1927. 262 p. Bibl., p. 229-255.

TITANIUM CHLORIDES

MELLOR, J. W. Titanium chlorides. *In his* Inorg. theor. chem. 7:86-87 (1927). 230 references.

TITANIUM FLUORIDES*

MELLOR, J. W. Titanium fluorides. *In his* Inorg. theor. chem. 7:69 (1927). 40 references.

TITANIUM OXIDES

MELLOR, J. W. The titanium oxides and hydroxides. *In his* Inorg. theor. chem. 7:44-49 (1927). 600 references.

TITANIUM SILICATES. See SILICATES.**TOBACCO**

ALVARADO, E. R. Index to the bulletins, circulars and articles on tobacco published by the Bureau of agriculture. *Philipp. Agr. Rev.* 20:179-184 (1927).

FERNANDEZ-DIAZ, EDOUARD. Le tabac en Bulgarie. Inaug.-diss., Lausanne, 1926. 307 p. Bibl., p. 303-304.

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Tabakchemie, des Tabakbaues und der Verarbeitung des Tabaks. *Chem.-Ztg.* 49:965-966, 969 (1925). 84 footnotes.

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Tabakchemie sowie der Erzeugung, Verarbeitung und Verwendung des Tabaks. *Fortschrittsber. Chem.-Ztg.* no. 3:102-104 (1928). 95 footnotes.

TOBACCO—Cont'd

O'SHEA, MICHAEL. Tobacco and mental efficiency. N. Y., Macmillan, 1923. 258 p. Bibl., p. 237-252.

SCHRUMPF-PIERON, PIERRE. Tobacco and physical efficiency; a digest of clinical data (with annotated bibliography). Published under auspices of the Committee to Study the Tobacco Problem, 1927. Annotated bibl., p. 56-126.

TOLUENE

EVANS, RALPH LIGGETT. I. A preliminary investigation of the chlorination of toluene. II. Diamino and nitramino diaryl ethers and certain of their derivatives. Thesis, Columbia Univ., 1925. 62 p. Bibl., p. 39, 40, 61.

TOPAZ

MELLOR, J. W. Topaz. *In his* Inorg. theor. chem. 6: 565-567 (1925). About 250 references.

TOURMALINE

GRANIGG, B., and KORITSCHNER, J. J. Die turmalinfuehrende Kupferkies-scheelit Lagerstaette am Monte Mulatto bei Predazzo. Z. prakt. Geol. 1913: 481-497. Bibl. on tourmaline-bearing ore deposits.

See also ALUMINUM SILICATES.

TOXICOLOGY

AUTENRIETH, WILHELM. Die Auffindung der Gifte und stark wirkender Arzneistoffe. Zum Gebrauche in chemischen Laboratorien. 5. Aufl. Tübingen, Mohr (P. Siebeck) 1923. 628 p. Bibl. footnotes.

FLURY, FERDINAND, and ZANGGER, HEINRICH. Lehrbuch der Toxicologie für Studium und Praxis. Berlin, Springer, 1928. 500 p. Contains bibls.

FLURY, FERDINAND, and ZERNIK, FRANZ. Zusammenstellung der toxischen und letalen Dosen für die gebräuchlichsten Gifte und Versuchstiere. *In* Abderhalden, Handb. biol. Arbeitsm. 4. pt. 7: 1289-1422 (1928). Bibl. through text.

KOHN-ABREST, E. La chimie toxicologique. *In* Dix ans d'efforts scientifiques et industriels, p. 639-664 (Paris, Chimie et industrie). Bibl. footnotes.

KOHN-ABREST, E. Les progrès en chimie toxicologique. Bull. soc. chim. 37: 773-812 (1925). Bibl. footnotes.

LEBEAU, ALBERT C. A. Étude expérimentale de l'intoxication mercurielle chez le chien. Thèse, Univ. de Paris, 1926. 63 p. Bibl., p. 61-63.

LE GUILLERMIC, PAUL. De la toxicité de la liqueur de Fowler chez le chien. Thèse, Univ. de Paris, 1927. 90 p. Bibl., p. 87-88.

LEWIN, L. Die Pfeilgifte. Leipzig, Barth, 1923. 517 p. Bibl. footnotes.

MUNCH, JAMES C. Toxicity of thallium sulphate. J. Am. Pharm. Assoc. 17: 1092-1093 (1928). 47 references.

OGIER, J. Traité de chimie toxicologique. Paris, Doin, 1924. 1350 p. Bibl. footnotes.

PEDLEY, F. G. Chronic poisoning by tin and its salts. J. Ind. Hyg. 9: 47 (1927). 24 references.

UNDERHILL, FRANK P. Toxicology; or, The effects of poisons. 2nd ed. Philadelphia, Blakiston's 1928. 311 p. Contains bibl.

See also BENZENE; LEAD; POISONS.

TOXINS

LOWENSTEIN, ERNST. Toxine und Toxoide. *In* Abderhalden, Handb. biol. Arbeitsm. XIII, pt. 2: 1136-1140 (1928).

SIMONIN, PIERRE. Introduction à l'étude des toxines vermineuses. Étude clinique-pathologie expérimentale. Nancy, Humblot, 1920. 323 p. Bibl., p. 297-314.

TRANSFERENCE NUMBER

FALK, K. G. Transference numbers of electrolytes in aqueous solution. International critical tables VI: 311-312 (1929). 61 references.

TRANSFORMER OILS. *See* INSULATING OILS.

TRANSPIRATION*

RICHARDSON, A. E. V. The water requirements of farm crops. J. Dept. Agr. Victoria 21: 193-212, 257-284, 321-339, 385-404, 449-481 (1923). 98 references.

TRIDYMITE. *See* SILICA AND SILICATES.

TRINITROTOLUENE

ESCALES, R. Die Explosivstoffe, vol. 6: Nitrosprengstoffe. Leipzig, Veit, 1915. 448 p. Bibl., p. 439; patents, p. 440-441.

See also EXPLOSIVES.

TRIPOLI

LADOO, R. B. Tripoli. *In his* Non-metallic minerals, 651 (1925). 16 references.

See also ABRASIVES; DIATOMACEOUS EARTH; SAND (Weigel).

TUNG OIL

GERARD, A. L'huile de Chine. Chimie et industrie, Special No., April, 1928: 590. 41 references.

See also OILS: DRYING.

TUNGSTEN

ALTERTHUM, H. Wolfram als chemisch-technischer Werkstoff. Z. angew. Chem. 42: 275-278, 308-314 (1929). 84 references.

BRANOIC, NILO. Tungsten. *Giorn. bibliografia tech. intern.* 1: 3-8 (1925). 56 references.

FINK, C. G. Tungsten. *Min. Ind.* 35: 684-694 (1927). 43 footnotes. 15 references, p. 694. 36: 591-604 (1927). Bibl. footnotes.

FISCHER, A. Beiträge zur Elektrochemie der Chromgruppe. I. Wolfram und Uran. *Z. anorg. Chem.* 81: 170-208 (1913). Bibl. footnotes.

MÜHLEN, LEO VON ZUR. Die Lagerstätten von Wolfram, Zinn und Molybdän in Russland. Stuttgart, Schweizerbart, 1926. 94 p. Bibl., p. 68-70, 80-81.

SMITHELLS, COLIN J. Tungsten. A treatise on its metallurgy, properties and applications. N. Y., Van Nostrand, 1927. 167 p. Extensive literature and patent citations are found at the end of each chapter.

VALLANCE, R. H., and ELDRIDGE, A. A. Tungsten. *In* Friend, Textbook inorg. chem. VII, pt. III: 181-271 (1926). Bibl. footnotes.

WANG, CHUNG YU. Bibliography of tungsten from 1918 to 1922 and from 1922 to 1924. 26 p. Reprinted from *J. Assoc. Chinese and American Engs.*, v. 5, no. 12, 1924. About 450 references.

TUNGSTEN SILICATES. See SILICATES.

TUNGSTEN SILICIDES. See SILICIDES.

ULTRAFILTRATION

BECHHOLD, H. Ultrafiltration and electrolultrafiltration. *In* Alexander, Colloid chemistry I: 836-837 (1926). 34 references.

GENIN, GEORGES. Ultrafiltration. *Rev. prod. chim.* 30: 641-644, 681-685 (1927). 18 references.

RHEINBOLDT, H. Methoden der Dialyse und Ultrafiltration. *Kolloid-Z.* 37: 387-397 (1925). 84 footnotes.

ULTRAMARINE

GRUNER, ERHARD. Zur Kenntnis der Ultramarine. *Z. angew. Chem.* 41: 446-450 (1928). 31 footnotes.

HOFFMANN, R. Das Ultramarin. Braunschweig, Vieweg, 1902. Muspratt: *Encyklopädisches Handbuch der technischen Chemie*, 4th ed., 8: 1495-1636. (1905). Bibl., p. 1625-1636 up to 1899.

See also ALUMINUM SILICATES.

UNITED STATES: Bureau of Chemistry and Soils.*

WEBER, GUSTAVUS A. The Bureau of Chemistry and Soils; its history, activities and organization. Baltimore, Johns Hopkins Press, 1928. 218 p. Bibl., p. 190-211.

UNITED STATES: Bureau of Dairy Industry.

CAMERON, JENKS. The Bureau of Dairy Industry; its history, activities and organization. Baltimore, Johns Hopkins Press, 1929. 74 p. Bibl., p. 67-72.

UNITED STATES: Bureau of Standards.*

WEBER, GUSTAVUS A. The Bureau of Standards; its history, activities and organization. Baltimore, Johns Hopkins Press, 1925. 299 p. Bibl., p. 271-282. 160 references.

UNSATURATED COMPOUNDS

BAUER, H. Methoden zum Nachweis und zur Erkennung ungesättigter Verbindungen. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 1: 463-542 (1925). Bibl. footnotes.

SAMPEY, JOHN R. Addition reactions of conjugated double bonds. *J. Chem. Education* 4: 884-885 (1927). 48 references.

STOERMER, R. Doppelte und dreifache Bindung. *In* Houben-Weyl, *Meth. org. Chem.* 3rd ed., II: 946-1041 (1925). Bibl. footnotes.

URANIUM

FISCHER, A. Beiträge zur Elektrochemie der Chromgruppe. I. Wolfram und Uran. *Z. anorg. Chem.* 81: 170-208 (1913). Bibl. footnotes.

KEESER, E., and ZOCHER, H. Kolloidchemische Studien an Uratgallerten. *Kolloidchem. Beihefte* 17: 189-218 (1923). Bibl. footnotes.

VALLANCE, R. H., and ELDRIDGE, A. A. Uranium. *In* Friend, Textbook inorg. chem. VII, pt. III: 272-350 (1926). Bibl. footnotes.

URANIUM SILICATES. See SILICATES.

UREA

AUGUSTE, CHARLES. Équilibre osmotique de l'urée dans le sang et le liquide céphalo-rachidien. Lille, O. Marquant, 1922. 143 p. Bibl., p. 135-140.

FEARON, WM. ROBERT. The biochemistry of urea. *Physiol. Rev.* 6: 432-439 (1926). 306 references.

UREASE

JACOBY, MARTIN. Urease. *Fermentforschung* 10: 8-12 (1928). 102 references.

See also AMIDASE; ARGINASE; ENZYMES.

URIC ACID

PIAUX, LÉON. Oxydation de l'acide urique en liqueur alcaline. État actuel de la question. *Bull. soc. chim. biol.* 7: 450-451 (1925). 40 references.

URINE

- DRABKIN, DAVID L. The normal pigment of the urine. I. The relationship of urinary pigment output to diet and metabolism. *J. Biol. Chem.* 75: 476-479 (1927). About 100 references.
- MARSHALL, E. K., JR. The secretion of urine. *Physiol. Rev.* 6: 473-484 (1926).
- PINCUSSEN, LUDWIG. Allgemeine und spezielle Chemie des Harns. *In* Oppenheimer, Handb. Biochem. 5: 470-583 (1924). 723 footnotes.
- PINCUSSEN, LUDWIG. Harnsedimente und Konkreme. *In* Oppenheimer, Handb. Biochem. 5: 584-591 (1924). 18 footnotes.
- PINCUSSEN, LUDWIG. Physikalische Chemie des Harns. *In* Oppenheimer, Handb. Biochem. 5: 446-469 (1924). 114 footnotes.
- WILLINGER, JOHANN. Die H-Ionenkonzentration im Pflanzenfresserharn. *Arch. ges. Physiol.* 202: 468-474 (1924). 45 footnotes.

URINE: Sugar.

- GREENWALD, ISIDOR, GROSS, JOSEPH, and MCGUIRE, GRACE. Observations on the nature of the sugars of normal urine. *J. Biol. Chem.* 75: 507-508 (1927). 27 references.
- GREENWALD, ISIDOR, GROSS, JOSEPH, and SAMET, JEROME. The nature of the sugars in normal urine. II. The sugar excretion upon various diets and the influence of diet upon glucose tolerance with some remarks on the nature of the action of insulin. *J. Biol. Chem.* 62: 433-434 (1924). 46 references.

VACUUM TECHNOLOGY *

- GOETZ, ALEX. Physik und Technik des Hochvakuaums. 2. Aufl. Braunschweig, Vieweg, 1926. 260 p. Bibl., p. 247-251.
- PETERS, KURT. Bemerkungen zur Vakuumtechnik. *Z. angew. Chem.* 41: 509-515 (1928). 43 footnotes.

VALENCE

- EPHRAIM, FRITZ. Chemische Valenz- und Bindungslehre. Leipzig, Akad. Verlagsges., 1928. 366 p. Bibl., p. 354-355.
- KREMAN, R. Die Restfeldtheorie der Valenz auf Grund der organischen Molekülverbindungen. *Sammlung chem. chem.-tech. Vorträge* 27: 237-242 (1924). 253 references.
- LEWIS, GILBERT N. Die Valenz und der Bau der Atome und Moleküle. Braunschweig, Vieweg, 1927. 200 p. Bibl., p. 192-194.

VANADATES *

- MELLOR, J. W. The vanadates of the alkaline earths. *In his* Inorg. theor. chem. 9: 772 (1929). About 30 references.
- MELLOR, J. W. The vanadates of the aluminium and lead families. *In his* Inorg. theor. chem. 9: 778-779 (1929). About 150 references.
- MELLOR, J. W. The vanadates of ammonium and the alkalies. *In his* Inorg. theor. chem. 9: 766 (1929). About 60 references.
- MELLOR, J. W. Vanadates of the bismuth and chromium families. *In his* Inorg. theor. chem. 9: 789-790 (1929). About 150 references.
- MELLOR, J. W. The vanadates of the copper family. *In his* Inorg. theor. chem. 9: 768 (1929). About 35 references.
- MELLOR, J. W. Vanadates of the magnesium family. *In his* Inorg. theor. chem. 9: 774-775 (1929). About 40 references.
- MELLOR, J. W. The vanadates of the manganese and iron families. *In his* Inorg. theor. chem. 9: 792 (1929). 20 references.

VANADIUM

- MELLOR, J. W. Vanadium. *In his* Inorg. theor. chem. 9: 714-739 (1929). History, 40; occurrence, 300; extraction, 175; properties, 300; atomic weights, 50 references.

VANADIUM ARSENATES. *See* ARSENATES.

VANADIUM CHLORIDES

- MELLOR, J. W. The vanadium chlorides and oxychlorides. *In his* Inorg. theor. chem. 9: 810-812 (1929). About 200 references.

VANADIUM FLUORIDES *

- MELLOR, J. W. The vanadium fluorides and oxyfluorides. *In his* Inorg. theor. chem. 9: 802-803 (1929). 30 references.

VANADIUM OXIDES

- DUMANSKI, A. Das Hydrosol des Vanadinpentoxyds. *Kolloid-Z.* 33: 147-159 (1923). 35 footnotes.
- FREUNDLICH, H., STAPELFELDT, F., and ZOCHER, H. Quantitative Untersuchungen am Vanadinpentoxydsol. I. Die Strömungsanisotropie. *Z. physik. Chem.* 114: 161-189 (1924-1925). Bibl. footnotes.
- GESSNER, HERMANN. Ueber einige Alterungserscheinungen an Vanadinpentoxyd-Solen. *Kolloidchem. Beihefte* 19: 213-297 (1924). Bibl. footnotes.
- MELLOR, J. W. Vanadium hemioxides, dioxide and trioxide. *In his* Inorg.

- theor. chem. 9:742-743 (1929). About 100 references.
- MELLOR, J. W. Vanadium pentoxide. *In his* Inorg. theor. chem. 9:755-757 (1929). About 300 references.
- MELLOR, J. W. Vanadium tetroxide and the hypovanadates. *In his* Inorg. theor. chem. 9:747-748 (1929). About 40 references.
- VANADIUM SILICIDES.** See SILICIDES.
- VANADIUM SULFATES**
- MELLOR, J. W. The vanadium sulphates. *In his* Inorg. theor. chem. 9:825 (1929). About 50 references.
- VANILLA**
- TAYLOR, HAYWOOD, M., and KONNERTH, R. A. Flavoring qualities of vanilla tinctures. *J. Am. Pharm. Assoc.* 16:559-561 (1927). 73 references.
- See also COUMARIN.
- VAPOR PRESSURE**
- CRAGOE, C. S. Vapor pressures and orthobaric densities above one atmosphere. International critical tables III:232-233 (1928). 196 references.
- CROMMELIN, C. A. Vapor pressures of the atmospheric gases. International critical tables III:204 (1928). 39 references.
- EGERTON, A. C., and EDMONDSON, W. Vapor pressure of chemical compounds in the crystalline state. International critical tables III:209 (1928). 116 references.
- FRAZER, J. C. W., TAYLOR, R. K., and GROLLMAN, A. Two-phase liquid-vapor isothermal systems. Vapor pressure lowering. International critical tables III:300 (1928). 55 references.
- GERMANN, ALBERT F. O. Vapor pressures and orthobaric densities above one atmosphere, two-phase liquid-vapor, organic compounds. International critical tables III:243-244 (1928). 40 references.
- JOHNSTON, J., FENWICK, F., and LEOPOLD, H. G. Vapor pressures of the metals. International critical tables III:206-207 (1928). 96 references.
- KEYES, F. G. Vapor pressures and orthobaric volumes for H_2O , NH_3 , CO_2 and SO_2 above one atmosphere. International critical tables III:236 (1928). 55 references.
- KLEMENC, ALFONS. Two-phase liquid-vapor systems at constant temperature, two components volatile, partial and total vapor pressures. International critical tables III:292 (1928). 145 references.
- KRACEK, F. C. P-T-X-relations for systems of two or more components and containing two or more phases. International critical tables III:380, 383, 385 (1928). 467 references.
- KUENEN, J. P. Theorie der Verdampfung und Verflüssigung von Gemischen und der fraktionierten Destillation. Leipzig, Barth, 1906. 209 p. Bibl., p. 133-134, 142-143, 181-183.
- MAASS, OTTO. Vapor pressure of chemical compounds in the liquid state for pressures up to two atmospheres. International critical tables III:214-215 (1928). 87 references.
- MENZIES, ALAN W. C. Vapor pressure of P, Se, S, Te, and the halogens. International critical tables III:202 (1928). 39 references.
- RAIKES, H. R., and BOWEN, E. J. Vapor pressures of organic liquids. International critical tables III:227 (1928). 140 references.
- Tensions de vapeur. Points d'ébullition ou de sublimation. *In* Tables annuelles V:228-311 (1917-1922); VI:149-179 (1923-1926).
- See also BOILING POINTS.
- VAPORIZATION: Heat of.**
- SMITH, A. W., DANIELS, F., and MATHEWS, J. H. Latent heat of vaporization. International critical tables V:135, 139 (1929). 103 references.
- VAPORIZATION: Velocity of.***
- EGERTON, A. C. Velocity of vaporization (and gas evolution) and of condensation (and gas absorption). International critical tables V:55 (1929). 85 references.
- VARNISHES**
- COFFIGNIER, CH. Les couleurs, laques, vernis et produits d'entretien. *In* Dix ans d'efforts scientifiques et industriels, p. 738-762 (Paris, Chimie et industrie). Bibl. footnotes.
- HEATON, NOEL. Volatile solvents and thinners used in the paint and varnish industries. London, Benn, 1925. 158 p. Bibl. at end of each chapter.
- SCHEIBER, JOHANNES. Lacke und ihre Rohstoffe. Leipzig, Barth, 1926. 642 p. Bibl., p. 613-614.
- SPROXTON, FOSTER. Cellulose ester varnishes. London, Benn, 1925. 178 p. Bibl. at end of each chapter.
- WOLFF, HANS. Uebersicht über die Literatur der Austrichstoffe und ihrer Rohstoffe im Jahre 1927. *Chem. Umschau* 35:218-221, 228-232, 256-258 (1928). Bibl. through text.
- See also LACQUERS; PAINTS; RESINS.
- VEINS***
- FRANKLIN, K. J. Physiology and pharmacology of veins. *Physiol. Rev.* 8:346-364 (1928). Bibl., p. 360-364. 166 references.

VENOMS. See POISONS: ANIMAL.

VENTILATION

HOTTINGER, MAX. Heizung und Lüftung, Warmwasserversorgung, Befuchtung und Entnebelung; Leitfaden für Architekten und Bauherrn. München, Oldenbourg, 1926. 293 p. Bibl., p. 285-291.

VERATRINE

QUERIDO, A. Action de la vératrine sur le tissu musculaire strié. Arch. néerland physiol. 12: 144-153 (1927).

See also ALKALOIDS.

VISCOSE

BAYER, —. Uebersicht über die Patentliteratur der letzten 10 Jahre auf dem Gebiete der Viskoseherstellung. Meliland Textilber. 8: 262-264 (1927). Bibl. through text.

WEINGAND, R. Cellulose hydrate films. In Ullmann's Enzyk. tech. Chem., 2nd ed., 3: 157-163 (1929). Classified list of patents, p. 160-163.

See also RAYON.

VISCOSITY

APPLEBEY, M. P. Viscosity of aqueous solutions of weak electrolytes and of all organic acids and bases. International critical tables V: 21 (1929). 41 references.

BATES, STUART J., and BAXTER, WARREN P. Viscosity of aqueous solutions of strong electrolytes. International critical tables V: 19 (1929). 104 references.

BINGHAM, EUGENE C. Fluidity of non-aqueous solutions. International critical tables V: 52 (1929). 158 references.

BIRCUMSHAW, L. I., and STOTT, V. H. Viscosity of gases. International critical tables V: 6 (1929). 42 references.

DORSEY, N. ERNEST. Viscosity of water, sulfuric acid, liquid carbon dioxide and certain organic liquids. International critical tables 5: 12 (1929). 41 references.

ERK, SIGMUND. Zähigkeitsmessungen an Flüssigkeiten und Untersuchungen von Viskosimetern. Berlin, VDI-Verlag, 1927. 54 p. Bibl., p. 53-54.

HATSCHEK, EMIL. The viscosity of liquids. London, Bell, 1928. 239 p. Bibl. at end of each chapter.

RHEINBOLDT, H. Bestimmung der Zähigkeit (Viskosität) von Flüssigkeiten. In Houben-Weyl, Meth. org. Chem. 3rd ed., 1: 1196-1206 (1925). Bibl. footnotes.

RIODES, F. H., and HODGE, H. B., JR. Viscosity relationships in the system sulfuric and nitric acid-water. Ind. Eng. Chem. 21: 149-150 (1929). 67 references.

ROSENHAIN, W. Viscosity of metals and alloys. International critical tables V: 10 (1929). 17 references.

STAUF, W. Methoden der Viskosimetrie. Kolloid-Z. 37: 397-405 (1925). 30 references.

TAMMAN, G., and PILLSBURY, M. E. Ueber die Viscositätsthermen binärer Mischungen. Z. anorg. allgem. Chem. 172: 242-255 (1928). Bibl., p. 254-255. 47 references.

Viscosité. In Tables annuelles V: 50-62 (1917-1922); VI: 55-73 (1923-1926).

VOGEL, H. Die Viskosimetrie kolloider Lösungen. In Liesegang, Kolloidchem. Tech. 137-163 (1927). Bibl. footnotes.

WEBER, FRIEDL. Viskosität und Elastizität des Protoplasma. Protoplasma 1: 167-176 (1926).

See also FLUIDITY; PLASTICITY.

VITAMINS

BECHDEL, SAMUEL I. The vitamin B requirement of the calf. J. Dairy Sci. 9: 437-438 (1926).

BERG, RAGNAR. Die Vitamine, kritische Uebersicht der Lehre von den Ergänzungsstoffen. 2 Aufl. Leipzig, Hirzel, 1927. 714 p. Bibl., p. 554-649.

BEZSSONOFF, N. Sur un nouveau régime scorbutigène nettement spécifique. Bull. soc. chim. biol. 9: 567 (1927). 24 references.

CANDELIN, A. Beiträge zum Vitamingehalt des Pferdefleisches und zur Speicherung von Vitamin A im Tierkörper. Inaug.-Diss., Leipzig, 1925. 26 p. Bibl., p. 25-26.

EDDY, W. H., and KELLOGG, M. The place of the banana in the diet. Am. J. Pub. Health 17: 27-35 (1927). 25 references.

EVANS, HERBERT McL., and BURR, GEORGE O. The antisterility fat-soluble vitamine E. Berkeley, Calif., Univ. of California Press, 1927. 176 p. Memoirs of the Univ. of California, v. 80. Bibl., p. 147-148.

GHOSE, SUDHINDRA NATH. The significance of vitamines in animal nutrition. Examination of the principal poultry and dairy feedingstuffs for their vitamine contents (A and B). J. Metabolic Res. 4: 510-513 (1923). 118 references.

HUNT, C. H. The influence of fertilizers on the vitamin B content of wheat. Ohio Agr. Expt. Sta., Bull. 415 (1927). 41 p. 67 references.

JONES, I. R., ECKLES, C. H., and PALMER, L. S. Rôle of vitamin A in the nutrition of calves. J. Dairy Sci. 9: 138-139 (1926). 31 references.

- KENNY, CHRISTOPHER L. A study of the thermostability of vitamin C. Thesis, Columbia University, 1926. 32 p. Bibl., at end.
- KOHMAN, E. F. Vitamins in canned foods. Nat. Canners Assoc., Res. Lab. Bull. 19L. Washington, D. C., 1922. 92 p. Bibl., p. 87-91. 191 references.
- KRUSE, H. D., and MCCOLLUM, E. V. Biochemical investigation of vitamin B. *Physiol. Rev.* 9: 218-239 (1929). 383 references.
- LORENZINI, JEAN. Théorie des vitamines et ses applications; essais de vitaminologie. Paris, Masson, 1925. 88 p. Bibl., p. 86-88.
- MATTILL, H. A., and CLAYTON, M. M. Vitamin E and reproduction on synthetic and milk diets. *J. Biol. Chem.* 68: 684-685 (1926). 36 references.
- MILLER, EDWARD HUGHES. The influence of hydrogen-ion activity upon the stability of vitamin A. Thesis, Columbia Univ., 1927. 30 p. Bibl., p. 29-30.
- PICKERING, ELIZABETH. Literature review on the production of antirachitic substances by the irradiation process. *J. Am. Pharm. Assoc.* 18: 366-371 (1929). 264 references.
- RANDOIN, L. La question des vitamines. II. Le facteur antiscorbutique. *Bull. soc. chim. biol.* 5: 841-864 (1923).
- RICHARDSON, WILLIAM D. The economics of vitamins. *Inst. of Margarine Manufacturers*, Bull. no. 11. 1927. 24 p. Bibl., p. 21-23.
- SANDELS, MARGARET R. Relative solubilities of the antineuritic and antipellagric vitamins in alcohol and a study of certain properties of these substances. Thesis, Columbia Univ., 1928. 75 p. Bibl., p. 72-75.
- SIMONNET, H. La question des vitamines. I. Le facteur lipo-soluble. *Bull. soc. chim. biol.* 5: 674-689 (1923).
- SMITH, S. L. Recent progress in vitamin research. *J. Home Econ.* 19: 189-197 (1927). 39 references.
- STIEPP, WILHELM O. Avitaminosen und verwandte Krankheitszustände. Berlin, Springer, 1927. 817 p. Bibl. with each section.
- STIEBELING, HAZEL K. Studies of the relation of vitamin D to the deposition of calcium in the bones of experimental animals, with special reference to the quantitative determination of vitamin D. Thesis, Columbia Univ., 1929. 27 p. Bibl., p. 25-26.
- SUNDERLIN, GERTRUDE, and WERKMAN, C. E. Synthesis of vitamin B by micro-organisms. *J. Bact.* 16: 32-33 (1928). 29 references.
- WEITZEL, WILLY. Die neuentdeckten lebenswichtigen Nährstoffe (Vitamine) und die Folgen einseitiger Ernährung, Fehlnährschäden. 3 Aufl. München, Aerztliche Rundschau O. Gmelin, 1926. 182 p. Bibl., p. 172-182. See also COD-LIVER OIL; FEEDING AND FEEDING STUFFS (Bechdel); FERTILIZERS (Hunt); METABOLISM; NUTRITION.

VULCANIZATION

- EATON, B. J., GRANTHAM, J., and DAY, F. W. F. Preparation and vulcanization of plantation Para rubber. *Fed. Malay St. Agric. Dept., Bull.* 27 (1918). Bibl., p. 395-398. 56 references.
- EMDEN, FRIEDR. Theorie und Praxis der Vulkanisationsbeschleunigung. *Kautschuk* 1926, no. 4: 91-94; no. 5: 110-112; no. 6: 137-138; no. 7: 158-161; no. 8: 180. 110 references.
- HALEN, S. Newer methods of vulcanization. *India Rubber Rev.* 25, no. 3: 40, 42 (1925). 70 patents.
- LEECH, FRANCIS B. Organic rubber accelerators. *Ind. Eng. Chem.* 18: 316-317 (1926). Patents only.
- MITCHELL, P. H. Effects de quelques acides organiques sur le vitesse de vulcanisation du caoutchouc. *Caoutchouc et Gutta-percha* 23: 13340-13342 (1926); 24: 13440-13443 (1927). 26 references.
- STOLL, L. Ueber Beschleuniger. *Gummi-Ztg.* 39: 752-755 (1925). 137 references.

See also ACCELERATORS; RUBBER.

VULCANIZED FIBER. See PAPER (ROSSMAN).

WALL BOARD *

- ROSSMAN, JOSEPH. History of laminated wall board patents. *Paper Trade J.* 86, no. 3: 45-47 (Jan. 19, 1928). 71 patents.
- ROSSMAN, JOSEPH. Wall board patent history. *Paper Trade J.* 86, no. 22: 50-53 (May 31, 1928). 79 patents.

See also PAPER.

WALL PAPER *

- ACKERMAN, P. Wall paper: Its history, design and use. Stokes, 1923. 268 p. Bibl., p. 257-263.

See also PAPER.

WASTE

- KERSHAW, JOHN B. C. The recovery and use of industrial and other wastes. London, Benn, 1928. 211 p. Bibl. at ends of chapters.
- LEITCH, R. D. Stream pollution by wastes from coke ovens. U. S. Public Health Repts. 40: 2021-2026 (1925). 87 references.

WASTE—Cont'd

WALKER, C. L., *et al.* Studies on the treatment and disposal of dairy wastes. N. Y., Cornell Sta., Bull. 425, 1923. 170 p. 77 references. Bibl., p. 63-65. 63 of these quoted from Hommon, U. S. Pub. Health Bull. 109 (1920).

See also SANITATION; SEWAGE.

WATER

BECKMAN, HENRY C. Water resources of Missouri, 1857-1926. Missouri, Bur. of Geol. and Mines, Repts. v. 20, 2nd ser. 1927. 424 p. Bibl., p. 408-417.

BROWN, JOHN S. Bibliography of coastal ground water. In U. S. Geol. Surv., Water-Supply Paper 537: 84-97 (1925). Classified by locality for U. S., chronological for other places. Annotated.

BUSWELL, A. M. Chemistry of water and sewage treatment. N. Y., Chem. Cat. Co., 1928. 362 p. Bibl. of 400 references.

CHADWELL, H. M. The molecular structure of water. Chem. Revs. 4: 375-398 (1927). 100 references.

FLINN, ALFRED D., *et al.* Waterworks handbook of design, construction and operation. N. Y., McGraw-Hill, 1927. 871 p. Contains bibl.

FRIEND, J. N., and TWISS, D. F. Water. In Friend, Textbook Inorg. Chem. VII, pt. I: 205-323 (1924). Bibl. footnotes.

HARVEY, H. W. Biological chemistry and physics of sea water. Cambridge, The University Press, 1928. 194 p. Bibl. at end of each chapter.

MILLER, ROBERT C., *et al.* A study of physical and chemical conditions in San Francisco Bay especially in relation to the tides. Univ. of California Publications in Zoology. v. 31, no. 11. 1928. Bibl., p. 263-266.

SIERP, F. Wasser und Abwasser. In Liesegang, Kolloidchem. Tech. 757-792 (1927). Bibl. footnotes.

SIERP, F. Wasser und Abwasser. Kolloid-Z. 47: 372-378 (1929). 50 footnotes.

STEFFENS, W. Neuere Forschungsergebnisse auf dem Gebiete der Wasserchemie. Arch. Pharm. 267: 145-158 (1929). 67 footnotes.

WATER: Analysis.

AMERICAN PUBLIC HEALTH ASSOC. *Laboratory section.* Standard methods for the examination of water and sewage. 6th ed. N. Y., The assoc., 1925. 119 p. Contains bibl.

BIRGE, EDWARD A., and JUDAY, CHANCEY. Organic contents of lake

water. Bull. Bur. Fisheries XLII: 204-205 (1926).

COLLINS, W. D., and HOWARD, C. S. Index of analyses of natural waters in the United States. U. S. Geol. Survey, Water-Supply Paper 560-C, p. 53-85 (1925). Classified by states. About 250 references.

FULWEILER, W. H. Report of sub-committee on determination of water. Application of distillation methods for moisture. Proc. Am. Soc. Testing Materials 25 I: 421-423 (1925). 56 references.

HALL, IVAN C. The practical utility of bacteriological control of water supplies. J. Am. Water Works Assoc. 19: 76-77 (1928). 30 references.

SCHURCH, C. F. Detection of phenols in water supplies. J. Am. Water Works Assoc. 14: 348-351 (1925). 34 references, annotated.

THERIAULT, EMERY J. The orthotolidine reagent for free chlorine in water. Reprint no. 1145 from the Public Health Repts. 42: 668-672 (1927). 5 p. Bibl., p. 4-5.

WATER: Mineral.

CORTI, HERCULES. Contribución al estudio de las fuentes termo-minerales de Rosario de la Frontera. Argentine Rep., Dirección general de minas, geología, e hidrología, Pub. no. 14. 1925. 21 p. Bibl. footnotes.

FITCH, WILLIAM E. Mineral waters of the United States and American spas. Philadelphia, Lea & Febiger, 1927. 799 p. Bibl., p. 756-763 and references at end of most chapters.

LEPAPE, A. Les eaux minérales. In Dix ans d'efforts scientifiques et industriels, p. 1115-1131 (Paris, Chimie et industrie). Numerous footnotes.

PIÉRY, ANTOINE M., and MILHAUD, M. Les eaux minérales radio-actives, émanothérapie générale et cures hydro-minérales. Paris, Doin, 1924. 456 p. Bibl., p. 393-426.

WATER: Pollution.*

HUSS, HAROLD A. Bakteriologiska undersökningsmetoders användbarhet vid bedömning av ett vattens renhetsgrad. Kungl. Svenska Vetenskapsakad. Handl. 59, no. 5. 1919. 73 p. Bibl., p. 71-73.

LEITCH, RICHARD D. Stream pollution by wastes from by-product coke ovens. A review with special references to methods of disposal. Reprint no. 1042 from the Public Health Repts. 40: 2021-2026 (1925). 6 p. Bibl., p. 5-6.

THERIAULT, EMERY J. The oxygen demand of polluted waters. I. Bibli-

- ographical. A critical review. II. Experimental. The rate of deoxygenation. U. S. Public Health Service, Public Health Bull. no. 173. 1927. 185 p.
- U. S. PUBLIC HEALTH SERVICE. Stream pollution. Washington, Govt. print. off., 1926. 51 p. Reprint no. 1063. Brief bibl. relating to studies of stream pollution, sewage and water supplies, p. 9-11.
- See also* SEWAGE.
- WATER: Purification.**
- BACH, H. Fortschritte in Wasserversorgungs- und Abwasserbeseitigungswesen. (1922-1924). Chem.-Ztg. 49: 4-5, 47-48, 81-82, 103, 110, 174-175, 197-199, 213-214, 241-243 (1925). 314 footnotes.
- Die neuesten D. R.-Patente auf dem Gebiete der Wasserreinigung. Wasser und Gas 17: 670-676 (1927). About 28 references.
- EDWARDS, GAIL PHILLIPS. The relation of hydrogen-ion concentration to the properties of alum floc. Illinois State Water Surv., Bull. no. 22 (Investigations of Chemical Reactions involved in Water Purification, 1920-1925, part II). Bibl., p. 128-133.
- ELLMs, JOSEPH W. Water purification. 2nd ed. N. Y., McGraw-Hill, 1928. 594 p. Bibl. at end of each chapter except the last.
- GALLAHER, WILLIAM U. Studies on the precipitation of calcium, magnesium, and aluminium. Illinois State Water Surv., Bull. no. 22 (Investigations of Chemical Reactions involved in Water Purification, 1920-1925, part III). Bibl., p. 128-133.
- HALL, RALPH E., *et al.* A physico-chemical study of scale formation and boilerwater conditioning. Min. and Met. Investigations, under auspices of Carnegie Inst. of Tech., U. S. Bur. Mines, and Min. and Met. Adv. Boards. Bull. 24. 1927. 239 p. Bibl. at end of most of the parts.
- HOFER, KARL. Bericht über die Fortschritte in der Aufbereitung des Speisewassers in den Jahren 1925-1927. Fortschrittsber. Chem.-Ztg. no. 1: 10-18 (1928). 254 footnotes.
- ILLINOIS. *Water survey*. Investigations of chemical reactions involved in water purification, 1920-1925. State of Illinois. Dept. of Registration and Education. Div. of the State Water Sur. Bull. no. 22. 1926. 133 p. Bibl., p. 128-133.
- KAUSCH, OSCAR. Neuerungen auf dem Gebiete der Wasserreinigung. Wasser und Gas 16: 669-675 (1926). About 32 references.
- ORNSTEIN, G. Chlorgas-Anwendung. Gesundh.-Ing. 51: 600-601 (1928). Most important papers since 1900.
- POWELL, SHEPPARD T. Boiler feed water purification. N. Y., McGraw-Hill, 1927. 363 p. Bibl. at end of each chapter.
- RUYS, JAN DANIEL. Drinkwater-reiniging met hypochlorieten. 1914. 6 pages of references.
- SPLITTGERBER, A. Chemische Ueberwachung von Kesselwasser-Enthärtungslagen. Z. Nahr. Genussm. 50: 142-177 (1925). 114 references.
- STEIN, MILTON F. Water purification plants and their operation. 3rd ed. N. Y., Wiley, 1926. 316 p. Contains bibl.
- TILLMANS, J. Wasserreinigung und Abwässerbeseitigung. Halle, Knapp, 1912. 157 p. Classified bibl., p. 124-125.
- See also* SANITATION; SEWAGE.
- WATER: Underground.**
- KELLER, HERMANN. Gespannte Wässer. Halle, Knapp, 1928. 90 p. Bibl., p. 86-88.
- KOEHN, WERNER W. Grundwasserkunde. Stuttgart, Schweizerbart, 1928. 291 p. Bibl., p. 268-277.
- RICHARDSON, LINSALL. Wells and springs of Somerset. With a bibl. of the Bath thermal waters, by W. Whitaker. London, H. M. Stationery Off., 1928. 279 p. Memoirs of the Geol. Surv., England. Bibl., p. 255-270.
- RICHARDSON, LINSALL. Wells and springs of Warwickshire. London, H. M. Stationery Off., 1928. 204 p. Gt. Brit. Geol. Surv. Memoirs. Bibls., p. 194-201.
- WATER-GAS**
- FULWEILER, W. H. Water-gas manufacture. In Recent progress in science in relation to the gas industry (Am. Gas Assoc., 1926), p. 44-45. 150 references.
- WATER GLASS.** *See* SILICA AND SILICATES.
- WATERPROOFING.** *See* FIBERS.
- WAXES**
- LÜDECKE, CARL. Die Wachse und Wachskörper. Stuttgart, Wiss. Verlagses., 1926. 161 p. Bibl., p. 153-154.
- WOLFF, H. Wachse. In Wiesner, Die Rohstoffe des Pflanzenreiches 2022-2023 (1928). 117 references.
- See also* FATS, OILS, WAXES.
- WEED SPRAYS ***
- ÅSLANDER, ALFRED. Sulphuric acid as a weed spray. J. Agr. Research 34: 1089-1091 (1927). 41 references.

WHEAT OIL *

BALL, CHARLES D., JR. Study of wheat oil. *Cereal Chem.* 3: 19-39 (1926). 40 references.

WHITE LEAD *

MELLOR, J. W. White lead. *In his Inorg. theor. chem.* 7: 849-852 (1927). 375 references.

See also PAINTS; PIGMENTS.

WIKITE *

LOKKA, LAURI. Ueber Wikit. *Bull. de la Commission geologique de Finlande*, no. 82. 1928. 68 p. Bibl. footnotes.

WINE

HARFF, H. Literaturliste der im Jahre 1912 erschienenen Arbeiten auf dem Gebiete der Mykologie der Weinbereitung. *Z. Gärungsphysiol.* 3: 272-276 (1914). About 110 references.

KAYSER, E. Les races de levures et leur influence sur le bouquet des vins. *Chimie et industrie*, Special no. : 619-625 (May, 1924). Review with bibl. of 36 references.

MENSIO, CARLO, and FORTI, CESARE. *Enologica. La fermentazione alcolica, la chimica e la tecnica dell'enologia*. Torino, Unione tipografico-editrice torinese, 1928. 540 p. Bibls. interspersed.

SANNINO, F. ANTONIO. *Tratado de enología*. Barcelona, Gili, 1925. 920 p. Bibl. footnotes.

SIMON, ANDRÉ L. *Bibliotheca Bacchica*, bibliographie raisonnée des ouvrages imprimés avant 1800 et illustrant la soif humaine sous tous ses aspects, chez tous les peuples et dans tous les temps. London & Paris, Maggs Bros., 1927. Bibl., p. 237-238.

WOOD

AHERN, GEORGE P., and NEWTON, HELEN K. A bibliography on woods of the world exclusive of the temperate region of North America and with emphasis on tropical woods. N. Y., Am. Soc. Mech. Engrs., 1928. 77 p.

BEVERSLUIS, JOZEF R. De micrografische identificatie van hout. Proefschrift, Landbouwhoogeschool, Wageningen. 1925. 132 p. Bibl., p. 125-130.

BREHMER, W. v. Hölzer. *In Wiesner, Rohstoffe des Pflanzenreiches*, 2: 1623-1646. 926 references.

HÄGGLUND, E. *Holzchemie*. Leipzig, Akad. Verlagsges., 1928. 275 p. Bibl. footnotes.

HAWLEY, LEE F., and WISE, LOUIS E. The chemistry of wood. N. Y., Chem. Cat. Co., 1926. 334 p. Bibl. footnotes.

KNIGHT, EUGENE V., and WULPI, MEINRAD. Veneers and plywood; their craftsmanship and artistry, modern production methods and present-day utility. Ronald Press, 1927. Bibl., p. 343-355.

NEWELL, ADNAH C. Wood and lumber. Peoria, Ill., The Manual Arts Press, 1927. 211 p. Bibl. at end of each chapter.

STAMM, ALFRED J. The capillary structure of softwoods. *J. Agr. Research* 38: 66-67 (1929). 37 references.

WILHELM, KARL, and ZEISEL, S. Hölzer. *In Wiesner, Die Rohstoffe des Pflanzenreiches II*: 277-829 (1918). Bibl. footnotes.

See also CELLULOSE; PAPER.

WOOD DISTILLATION

BUGGE, GUNTHER. Industrie der Holzdestillationsprodukte. Dresden, Steinkopf, 1927. 216 p. Bibl., p. 181-186.

BUNBURY, H. M. Destructive distillation of wood. London, Benn, 1923. 320 p.

LICHTENBERGER, JEAN. La carbonisation du bois. *In Dix ans d'efforts scientifiques et industrielles*, p. 159-198. Bibl., p. 195-198. 196 references.

PRINGSHEIM, HANS. Ueber die Zusammensetzung des Holzgeistes und Acetonöls. *Z. angew. Chem.* 40: 1387-1393 (1927). 48 footnote references.

PRINGSHEIM, H., and SCHREIBER, A. Ueber Bestandteile des Holzgeistes und Aceton-Oels. *Cellulosechemie* 8: 45-66 (1927). 57 references.

SCHREIBER, J. Ueber die Bestimmung von Holzöl. *Farbe u. Lack* 1928: 274, 286-287. 23 footnotes.

WIND, RUTGERT. Onderzoek naar de vooruitzichten van de houtverkolingsindustrie in Nederlandsch-Indië. Proefschrift Wageningen, 1925. 211 p. Bibl., p. 209-211.

WOOD PRESERVATION

HUBERT, ERNEST E. Diagnosis of decay in wood. *J. Agr. Research* 29: 565-567 (1924). 92 references.

MOLL, FRIEDRICH. Die Imprägnierung des Holzes nach dem Verfahren des Dr. Boucherie. *Chem. App.* 2: 65-67 (1915). Largely patents.

SEDLACZEK, —. Ueber die Konservierung des Holzes. *Kunststoffe* 14: 49-52, 103-105, 134-136 (1924). Patents through text.

WOOD PULP. See PAPER.**WOOL**

Canada. *Honorary Advisory Council for Scientific and Industrial Research*. Bibliography on wool. Ottawa, 1927. 174 p. Mimeographed.

- COLE, ARTHUR H. The American wool manufacture. 2 v. Harvard Univ. Press, 1926. Bibl., v. 2: 303-314.
- COOK, E. F. H. The bleaching of wool with sulphur dioxide. *J. Textile Inst.* 17: 371-378T (1926). 40 references. See also FIBERS.
- XANTHIC ACID.** See THIOCARBONIC ACID.
- XENON**
Xenon. In Gmelin's Handb. anorg. Chem. 8th ed., System-Nummer I: 182-192 (1926). Bibl. through text. See also AIR; ATMOSPHERE; RARE GASES.
- X-RAYS ***
BROGLIE, MAURICE DE. X-rays. N. Y., Dutton, 1925. 204 p. Bibls. at ends of chapters. Patents, p. 23, 51-52, 81-82, 131-133, 163-164, 183-184, 197.
- DAUVILLIER, A. La technique des rayons X. 1924. 195 p. Bibl. footnotes.
- DAVEY, WHEELER P. Contribution of X-ray studies of crystal structure to organic chemistry. *Chem. Reviews* 6: 156 (1929). 28 references.
- BECKER-ROSE, H. Ergebnisse der Materialprüfung mit Röntgenstrahlen, Chem. Fabrik 1929: 271. 42 references.
- GLOCKER, RICHARD. Materialprüfung mit Röntgenstrahlen, unter besonderer Berücksichtigung der Röntgenmetallographie. Berlin, Springer, 1927. 377 p. Bibl., p. 362-370.
- HÜTTIG, GUSTAV F. Ueber Gitterbestandteile die im Kristallgitter vagabundieren. *Fortschr. Chem., Phys., physik. Chem.* 18: 1-32 (1924). Bibl. footnotes.
- KARSEN, A. Röntgenstrahlen en organische chemie. *Chem. Weekblad* 25: 114-127 (1928). 53 footnotes.
- LILIENFELD, J. E. Die Hochvakuum-Röntgenröhren. *Jahrb. Radioakt. Elektronik* 16: 107-109 (1919). 81 references.
- MAUGUIN, CH. La structure des cristaux déterminée au moyen des rayons X. (Recueil des conférences-rapports de documentation sur la physique, v. 6). 1924. 281 p. Bibl., p. 267-276.
- NEUBERGER, M. C. Roentgengraphie des Eisens und seine Legierungen. Sammlung chem. chem.-tech. Vorträge 30. 124 p. 1928. Bibl., p. 121-124.
- Rayons X. In Tables annuelles V: 821-835 (1917-1923); VI: 812-828 (1923-1926).
- SCHIEBOLD, E. Ueber graphische Auswertung von Röntgenphotogrammen. *Z. Physik* 28: 69-70 (1924). 50 references.
- SIEGBAHN, M. Spektroskopie der Röntgenstrahlen. Berlin, Springer, 1924. Bibl., p. 239-255.
- WARREN, STAFFORD L. The physiological effects of Roentgen radiation upon normal body tissues. *Physiol. Rev.* 8: 125-129 (1928). 165 references.
- WYCKOFF, R. W. G. X-ray diffraction data from crystals and liquids. International critical tables I: 352-353 (1925). 402 references.
- WYCKOFF, RALPH W. G. X-ray diffraction data—Miscellaneous natural and industrial materials. International critical tables II: 356-357 (1927). 264 references.
- See also SPECTROSCOPY (Hevesy, Laue, Siegbahn).
- YEAST**
BOAS, F. Hefen. In Wiesner, Die Rohstoffe des Pflanzenreiches I: 1120-1122 (1927). 110 references.
- JÖRGENSEN, ALFRED P. C. Micro-organisms and fermentation. 5th ed. London, Griffin, 1925. 467 p. Bibl., p. 403-461.
- LAFAR, FRANZ. Hefe. In Wiesner, Die Rohstoffe des Pflanzenreiches III: 912-948 (1921). Bibl. footnotes.
- OLSEN, A. G., and BAILEY, C. H. Study of the proteases of bread yeast. *Cereal Chem.* 2: 84-86 (1925). 51 references.
- SCHWEIZER, CHARLES. Revue des industries de la levure. *Chimie et industrie* 15: 871-880; 16: 190-199 (1926). 301 footnotes.
- WINSLOW, CHARLES E. A., and FLEESON, ELIZABETH H. The influence of electrolytes upon the electrophoretic migration of bacteria and of yeast cells. *J. Gen. Physiol.* 8: 212-214 (1926).
- WINSLOW, CHARLES E. A., and UPTON, M. F. The electrophoretic migration of various types of vegetable cells. *J. Bact.* 11: 391-392 (1926).
- See also ENZYMES; FERMENTATION.
- YERBA MATÉ.** See MATÉ.
- ZEOLITES**
SCURTI, F. Per la conoscenza del terreno agrario. Le zeolite naturali. *Ann. chim. appl.* 13: 161-193 (1923). 73 footnotes.
- See also ALUMINUM SILICATES; WATER PURIFICATION.
- ZINC**
GREGORY, J. C., and BURR, M. S. Zinc and its compounds. In Friend, Textbook Inorg. Chem. III, pt. II: 92-158 (1926). Bibl. footnotes.

ZINC—Cont'd

- O'HARRA, B. MARVEL. Bibliography on zinc retorts and condensers. School of Mines and Metallurgy, Univ. of Missouri. Tech. Bull. v. 8, no. 4, Aug., 1925. 15 p. 195 references.
- O'HARRA, B. MARVEL. Metallurgical treatment of zinc retort residues. Bur. Mines, Tech. Paper 341. 25 p. 1925. Bibl., p. 22-25.
- RESEARCH SERVICE, INC. Zinc in its corrosion resistance. N. Y., Amer. Zinc Inst., Inc., 1928. 82 p.
- TAINTON, U. C., and LEYSON, L. T. Electrolytic zinc from complex ores. Trans. Am. Soc. Min. Met. Eng. 70: 486-522 (1924). Bibl. footnotes.
- Zink. In Gmelin's Handb. anorg. Chem., System-Nummer 32. Leipzig, Verlag Chemie, 1924. 329 p. Bibl. through text. Covers the metal and its compounds, through 1923.
- ZINC: Alloys.** See ALLOYS; BRASS.
- ZINC: Organic compounds.** See ORGANOMETALLIC COMPOUNDS.
- ZINC ARSENATES.** See ARSENATES.
- ZINC SILICATES.** See SILICATES.
- ZINC SULFIDES**
- SCHLEEDE, ARTHUR. Ueber die Schwärzung des Zinksulfids durch

Licht. Z. physik. Chem. 106: 386-398 (1923). Bibl. footnotes.

SEEBACH, M. Wurtzit. In Doelter, Handb. Mineralchem. 4, pt. 1: 329-336 (1926). 25 footnotes.

SEEBACH, M. Zinkblende. In Doelter, Handb. Mineralchem. 4, pt. 1: 304-328 (1926). 112 footnotes.

ZIRCONIUM

JACOBY, R. Zirkonium. In Gmelin-Kraut, Handb. anorg. chem. VI, pt. 1: 1-67, 648-784 (1928). Bibl. through text.

MELLOR, J. W. Zirconium. In his Inorg. theor. chem. 7: 98-165 (1927). History, 40; occurrence, 40; extraction, 130; preparation, 60; physical properties, 120; chemical properties, 270; references to salts throughout text.

ZIRCONIUM OXIDES*

MELLOR, J. W. The zirconium oxides. In his Inorg. theor. chem. 7: 132-134 (1927). 300 references.

ZIRCONIUM SILICIDES. See SILICIDES.**ZYMASES**

OPPENHEIMER, CARL. Die Fermente des Hexosenabbaues: Zymasen. In his Die Fermente, 1415-1563, 1564-1705 (1926). 1460 references.

See also ENZYMES.

PERSONAL BIBLIOGRAPHIES

- AMBRON, HERMANN. *Kolloid-Z.* 44: 6-8 (1928).
- BECKMANN, ERNST. 1853-1923. In Lockemann, Ernst Beckmann, sein Leben und Wirken. 1927. 65 p.
- BEHREND, ROBERT. 1856-1926. Ber. 59A: 161-164 (1926). 101 titles.
- BILLETER, OTTO. *Helvetica Chim. Acta* 11: 700-710 (1928).
- BOLTWOOD, BERTRAM B. 1870-1927. *Am. J. Sci.* 15: 198 (1928).
- BRINELL, JOHAN AUGUST. *Rev. métal.* 23: 119-120 (1926).
- COHEN, ERNST. *Chem. Weekblad* 24: 489-493 (1927).
- DRESER, HEINRICH. *Arch. exptl. Path. Pharm.* 106, nos. 3-4: i-vii (1925). 45 titles.
- ELLINGER, PHILIPP. 1870-1923. *Ergeb. Physiol.* 23, I: 139-144 (1924).
- ESCALES, RICHARD. *Z. ges. Schiess-Sprengstoffw.* 19: 146 (1924); *Kunststoffe* 14: 146 (1924).
- FROUIN, ALBERT. 1870-1926. *Bull. soc. chim. biol.* 8: 1225a-1225f (1926).
- GROTHS, P. H. v. *Z. Krystall.* 58: 3-6 (1923).
- HABER, FRITZ. *Z. Elektrochem.* 34: 799-802 (1928).
- HALLER, A. 1849-1925. *Bull. soc. chim.* 39: 1078-1092 (1926).
- HENRY, THOMAS A. *Pharm. J.* 119: 375-376 (1927).
- HERZIG, JOSEPH. 1853-1925. Ber. 58A: 55-75 (1925). 72 footnotes.
- HOWE, HENRY MARION. 1848-1922. *Nat. Acad. Sci., Memoirs*, vol. 21. 11 p.
- KAST, HERMANN. *Z. ges. Schiess-Sprengstoffw.* 22: 305-308 (1927). 32 titles.
- KNORR, LUDWIG. 1859-1921. Ber. 60A: 30-34 (1927).
- KÖRNER, WILHELM. 1839-1925. Ber. 59A: 108-111 (1926).
- KUHARA, MITSURU. 1855-1919. In Mitsuru Kuhara's On the Beckmann rearrangement, Kyoto, 1926, p. 81-83.
- LILIENFELD, LEON. *Kunstseide* 10: 401-407 (1928).
- LOEB, JACQUES. *J. Gen. Physiol.* 8: Ixiii-xcii (1928). 404 titles.
- MASSART, J. *Rend. accad. Lincei* 4, Appendix: iii-xiii (1926).
- MOLINARI, ETTORE. *Il notiz chim.-ind.* 1: insert of 2 p. preceding p. 365 (Nov., 1926).
- MORLEY, EDWARD WILLIAMS. 1838-1923. *Nat. Acad. Sci., Memoirs*, vol. 21. 8 p.
- MORSE, HARMON NORTHROP. 1848-1920. *Nat. Acad. Sci., Memoirs*, vol. 21. 14 p.
- OSAKA, YIKICHI. In *The Sexagint*, Kyoto, 1927, p. 289-293.
- POMILIO, UMBERTO. *Notiz chim.-ind.* 2: 77 (1927). 47 titles.
- POWER, FREDERICK B. *Am. J. Pharm.* 96: 605-613 (1924). 127 titles.
- PRIVOZNIK, EDUARD. *Oester. Chem.-Ztg.* 31: 20-21 (1928). 54 references.
- PROCTOR, HENRY R. *J. Intern. Soc. Leather Trades Chem.* 12: 124-130 (1928); *J. Am. Leather Chem. Assoc.* 23: 556-561 (1928). 121 titles.
- RATHKE, HEINRICH B. 1840-1923. Ber. 57A: 92 (1924). 37 titles.
- REMSEN, IRA. 1846-1927. *J. Am. Chem. Soc.* 50: 80-86 (1928).
- SABINE, WALLACE C. W. 1868-1919. *Nat. Acad. Sci., Memoirs*, vol. 21. 19 p.
- SIMON, LOUIS JACQUES. 1867-1925. *Bull. soc. chim.* 39: 1666-1674 (1926). 130 titles.
- SMITH, ALEXANDER. 1865-1922. *Nat. Acad. Sci., Memoirs*, vol. 21. 7 p.
- THIELE, JOHANNES. 1865-1918. Ber. 60A: 127-132 (1927).
- TRAUBE, W. *Z. angew. Chem.* 39: 65-67 (1926).
- VALEUR, AMAND. 1870-1927. *Bull. soc. chim.* 43: 501-504 (1928).
- WAKKER, J. H. *Arch. Suikerind.* 35: 968-973 (1927).
- WELSBACH, CARL AUER VON. *Oest. Chem.-Ztg.* 31: 145 (1928).
- WILL, HERMANN. *Z. tech. Biol.* 9: 92-100 (1921).

BULLETIN
OF THE
NATIONAL RESEARCH COUNCIL

March, 1932

Number 86

BIBLIOGRAPHY OF BIBLIOGRAPHIES ON CHEMISTRY
AND CHEMICAL TECHNOLOGY

Second Supplement
1929-1931

Compiled for Research Information Service

BY

CLARENCE J. WEST,
*Director, Research Information Service,
National Research Council*

AND

D. D. BEROLZHEIMER,
*Chemical Literature Expert,
50 E. 41st St., New York, N. Y.*

PUBLISHED BY THE NATIONAL RESEARCH COUNCIL
OF
THE NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D. C.

1932

PREFACE

This Bulletin is the second supplement to the Bibliography of Bibliographies on Chemistry and Chemical Technology, published in 1925 as Bulletin No. 50 of the National Research Council (First Supplement published in 1929 as Bulletin No. 71 of the National Research Council). Although most of the bibliographies listed in this Bulletin have been published since 1929, many older ones have been included so as to make the combined publication as complete as possible.

It is suggested that users in search of information regarding published bibliographies consult the three Bulletins comprising this series (*i. e.*, Bulletins Nos. 50, 71 and 86). Subject headings appearing for the first time in this Bulletin have been indicated with an asterisk.

The compilers will appreciate it if errors in the citations in this Bulletin or omissions of published bibliographies are called to their attention.

CLARENCE J. WEST
D. D. BEROLZHEIMER.

WASHINGTON, D. C.
NEW YORK, N. Y.
Jan. 1, 1932.

BIBLIOGRAPHIES ON SPECIAL SUBJECTS

ABIETIC ACID

RUZICKA, L. The constitution of *l*- and *d*-pimaric and abietic acids. *Bull. inst. pin.* 1922:112-122. 45 references.

ABRASIVES

EARDLEY-WILMOT, V. L. Artificial abrasives and manufactured abrasive products. Canada, Dept. of Mines, Mines Branch, No. 699. 1929. 144 p. *Bibl.*, p. 109-119.

IMPERIAL INSTITUTE. Abrasives. London, H. M. Stationery Off., 1929. 67 p. *Bibl.*, p. 62-67.

ABSORPTION: Physical. *See* ADSORPTION.

ABSORPTION: Physiological.

FRIEDEMANN, W., and KWASNIEWSKI, St. Parenterale Resorption. In *Op-
penheimer, Handb. Biochem.*, 2nd ed.,
5: 254-294 (1924). 176 footnotes.

STARLING, ERNEST H. Die Resorption vom Verdauungskanal aus. In *Op-
penheimer, Handb. Biochem.*, 2nd ed.,
5: 217-253 (1924). 90 footnotes.

See also METABOLISM.

ABSORPTION SPECTRA. *See* SPECTRA.

ACCELERATORS. *See* RUBBER, VULCANIZATION.

ACETALDEHYDE

ULLRICH, A. Die Herstellung von Acetaldehyd. *Metallbörse* 21:315-316, 363-364, 413 (1931). Patents through text.

See also ACETIC ACID (Bugge).

ACETIC ACID

BUGGE, G. Essigsäure. In *Ullmann, Enzyk. tech. Chem.*, 2d ed., 4: 641-690 (1929). Patents: Production of acetaldehyde, p. 644-649; production of acetylene from hydrocarbons, p. 649; production of acetic acid, p. 654; concentration of acetic acid, p. 658-660; esterification of acetic acid, p. 681-682; amyl acetate from chlorinated hydrocarbons, p. 685-686.

DAVIDSON, ARTHUR W. Introduction to the chemistry of acetic acid solutions. *Chem. Reviews* 8: 189-190 (1931). 29 references.

HALL, NORRIS F. Acid-base equilibria in non-aqueous solvents with particu-

lar reference to glacial acetic acid. *Chem. Reviews* 8: 211-212 (1931). 54 references.

HERMANN, S., and NEUSCHUL, P. Zur Biochemie der Essigbakterien. *Biochem. Z.* 233: 214, 216 (1931). 28 references.

MULLIN, C. E., and HUNTER, H. L. Acetic acid from acetylene. *Chemical Markets* 28: 597-601; 29: 44-47, 268-272, 380-384 (1931). Patent abstracts through text.

MULLIN, CHARLES E., and HUNTER, H. L. The manufacture of acetic acid by hardwood distillation. *Cellulose* 1: 138-141, 170-174 (1930). *Bibl.* of 34 references, p. 173-174. Patents through text.

MULLIN, C. E., and HUNTER, H. L. The manufacture of acetic acid by the distillation of wood. *Cellulose* 1: 183-187, 215-218 (1930). Abstracts of patents.

PARTRIDGE, E. P. Acetic acid and cellulose in the United States. *Ind. Eng. Chem.* 23: 497-498 (1931). 44 references.

Vanadium catalysts in acetic acid manufacture. *Vancoram Rev.* 2: 90-91 (1931). 29 patents and 8 general references.

WÜSTENFELD, HERMANN. *Lehrbuch der Essigfabrikation.* Berlin, Parey, 1930. 403 p. *Bibl.*, p. 389-390.

See also FERMENTATION.

ACETIC ANHYDRIDE *

BUGGE, G. Essigsäureanhydrid. In *Ullmann, Enzyk. tech. Chem.*, 2d ed., 4: 690-697 (1929). *Bibl.* footnotes. Patents, p. 691-692, 696.

ACETONE. *See* FERMENTATION (Smyth, Ullrich).

ACETYLENE

PETERS, K. Die Umwandlung des Methans in Acetylen. *Z. angew. Chem.* 43: 855-860 (1930). 30 footnotes.

See also ACETIC ACID (Bugge).

ACID ANHYDRIDES *

PYTASZ, T., and RABEK, T. J. Preparation of anhydrides of carboxylic acids. *Przemysl Chem.* 14: 529-535 (1930). 22 references.

ACID-BASE EQUILIBRIUM *

FLARER, F. Osservazioni sull'equilibrio acido-basico in rapporto all'apparato cutaneo: la riserva alcalina. *Biochim. terap. sper.* 15: 252-254 (1928). 62 references.

See also BLOOD, URINE.

ACIDOSIS

DAUTREBANDE, LUCIEN. Der Gaswechsel in den Lungen und in den Geweben. *Ergebnisse inneren Medizin u. Kinderheilkunde* 40: 339-370 (1931). Extensive bibl.

ACIDS, ALKALIS, SALTS

SOCIETY OF CHEMICAL INDUSTRY. Acids, alkalis and salts. *In* Reports on the progress of applied chemistry 14: 192-234 (1929); 238 footnotes. 15: 177-208 (1930); 137 footnotes.

WAESER, BRUNO. Alkalien und Erdalkalien. Dresden, Steinkopff, 1931. 196 p. Bibl. footnotes. Patents through text.

See also Names of the individual acids, alkalis and salts, INORGANIC CHEMISTRY.

ACIDS: Organic

CHALLENGER, F. Technical applications of aliphatic acids. *Ind. Chemist* 6: 392 (1930). 40 references.

HOLDE, D., BLEYBERG, W., and RABINOWICZ, I. Ueber die in der Natur vorkommenden hochmolekularen gesättigten Fettsäuren. *Chem. Umschau Fette, Oele, Wachse Harze* 36: 245 (1929). 24 references.

VESELY, V. Sur la composition de la stearine et de l'oleine. *Chimie et industrie* 22: 688 (1929). 29 references.

See also BIOCHEMISTRY (Peters and Van Slyke).

ACONITE. *See* ALKALOIDS, PHARMACEUTICALS (Munch).

ACTINIUM

ELSEN, G. Het actiniumvraagstuk. *Chem. Weekblad* 25: 517-523 (1928). 49 footnotes.

ADRENALINE

ANTONINI, AUGUSTO. Acute insufficiency of the adrenal glands. *Rass. clin. terap. sci. affini* 29: 329-350 (1930). 4 p. of bibl.

BRITTON, S. W. Adrenal insufficiency and related considerations. *Physiol. Rev.* 10: 675-682 (1930). 311 references.

CARBONARO, C. L'azione dell'adrenalina sulla pressione sanguigna in rapporti alle diverse vie d'introduzione nell'organismo. *Arch. intern. pharmacodyn. therapie* 35: 201-205 (1929). 74 references.

GAUTRELET, J., *et al.* Influence de l'adrénaline sur les variations immédiates de la réserve alcaline. *Compt. rend. soc. biol.* 12: 1143-1145 (1930). 45 references.

HARTUNG, WALTER H. Epinephrine and related compounds. Influence of structure on physiological activity. *Chem. Reviews* 9: 458-465 (1931). 256 references.

KINDLER, K., and PESCHKE, W. Ueber die Synthese von Adrenalin und von adrenalinähnlichen Verbindungen. *Arch. Pharm.* 269: 581-606 (1931). 56 footnotes.

SUN, T. P. Influence of thyroid deficiency on the structure and epinephrin content of the adrenal gland of the albino rat. *J. Morphology* 48: 69-72 (1929).

TRENDELENBURG, PAUL. Nebennieren und sonstiges chromaffines Gewebe. *In* *his* Die Hormone I: 185-340 (1929). Extensive bibl. footnotes.

VOLLMER, HERMANN. Die zweiphasische Wirkung des Adrenalins. *Biochem. Z.* 140: 417 (1923). 25 references.

See also PHARMACEUTICALS (Munch), SUPRARENALS.

ADSORPTION

Adsorption. *In* *Tables Annuelles* 6: 1205-1225 (1928). 7: 1430-1454 (1930). References through text.

BALAREW, D. Ueber die innere Adsorption in Kristallsalzen. *Kolloidchem. Beihefte* 30: 295-296 (1930). 92 references.

BLÜH, OTTO. Adsorption. *In* Auerbach and Hort, *Handb. physik. tech. Mechanik* 7: 592-594 (1930). 130 references.

BRADLEY, R. S. The nature of the absorbed phase. *Chem. Reviews* 9: 74-75 (1931). 57 references.

FAURÉ-FREMIET, E., and NICHITA, G. Charge électrique et agglutination chez les amibocytes d'invertébrés marins. *Ann. physiol.* 3: 279-284 (1927).

GARNER, W. E. Adsorption on solids with special reference to molecular orientation. *Trans. Faraday Soc.* 22: 464 (1926). 31 references.

KRCZIL, FRANZ. Untersuchung und Bewertung technischer Adsorptionsstoffe. Leipzig, Akad. Verlagsges., 1931. 504 p. Bibl. footnotes.

LANDT, E., and BHARGAVA, K. K. Ueber die Adsorptionseigenschaften von aktivierten, aschenfreien Kohlepreparaten. *Z. Ver. deut. Zuckerind.* 79: 483-484 (1929). 34 references.

MÜLLER, ERICH, and SCHWABE, KURT. Die Aufnahmefähigkeit der Platin-

metalle für Wasserstoff. *Z. Elektrochem.* 35: 165-184 (1929). 66 footnotes.

PIATTI, LUIGI. Dampfdrucke binärer Gemische und ihre Bedeutung für die Absorption flüchtiger Stoffe. *Sammlung chem., chem.-tech. Vorträge*, N. F., No. 7. 1931. 53 p. 68 footnotes.

WEIDMANN, JULIUS. Ueber Bakterienadsorption an Pulver, unter Berücksichtigung der Pulver-Therapiex bei Infektions-Krankheiten. *Inaug.-Diss.*, Zurich, 1919. 102 p. *Bibl.*, p. 99-102.

See also CARBON: ACTIVATED, COLLOIDS.

ADSORPTION, HEAT OF

KRUYT, H. R., and MODDERMAN, JOHANNA G. Heats of adsorption and their bearing on the problem of adsorption. *Chem. Reviews* 7: 344-346 (1930). 91 references.

See also THERMOCHEMISTRY.

AGRICULTURAL CHEMISTRY

JACOB, A. Fortschritte der Agriculturnchemie seit dem Jahre 1918. *Z. angew. Chem.* 44: 9 (1931). 73 references.

PAN AMERICAN UNION. Selected list of publications on tropical agriculture. Washington, D. C., 1930. 90 p. Mimeographed. References classified.

See also DAIRY PRODUCTS, FERTILIZERS, SOILS.

AIR: Analysis *

ANGERER, K. v. Die Methodik der bakteriologischen Luftuntersuchung. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 11: 179-200 (1929). *Bibl. footnotes.*

LODE, ALOIS. Hygienische Methoden der Luftuntersuchung. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 11: 265-362 (1929). *Bibl. through text.*

AIR CONDITIONING

Papers presented before the American Society of Heating and Ventilating Engineers (Classified according to subject). *Heating, Piping* 2: 429-438 (1930).

ALANINE

MAHN, HERBERT. Alanin. *In* Abderhalden, *Biochem. Handl.* 12: 387-421 (1930). Numerous *bibl. footnotes.*

ALBUMIN

BANCROFT, WILDER D., and RUTZLER, J. E., JR. The denaturation of albumin. *J. Phys. Chem.* 35: 144-161 (1931). *Bibl. footnotes.*

Serum-albumin. *Index-Cat.*, S. G. O., 3rd ser., 9: 563 (1931).

SPIEGEL-ADOLF, MONA. Hitzeveränderungen des Albumins. *Biochem. Z.* 170: 126-172 (1926). 75 footnotes.

See also PROTEINS.

ALBUMINURIA

HARTWICH, ADOLF. Die gutartigen Albuminurien. *Ergebnisse inneren Medizin u. Kinderheilkunde* 38: 44-51 (1930).

ALCHEMY

INTERNATIONAL UNION OF ACADEMIES. Catalogue des manuscrits alchimiques grecs. Brussels, Lamertin, 1924+. (Tome VII in 1930.)

VON LIPPMANN, EDMUND O. Entstehung und Ausbreitung der Alchemie. 2. Band. Berlin, Springer, 1931. 258 p. *Bibl. footnotes.*

STRIEDINGER, IVO. Der Goldmacher Marco Bragadino. München, Ackermann, 1928. 379 p. *Bibl.*, p. 357-373.

See also HISTORY.

ALCOHOL: Industrial. See MOTOR FUELS.

ALCOHOLS

EICHWALD, EGON. Konstitution und Nachweis der Alkohole. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 4: 63-172 (1924). *Bibl. footnotes.*

WEIL, ARTHUR. Allgemeine Methoden zum Nachweis hochmolekular Alkohole. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 4: 173-191 (1924). *Bibl. footnotes.*

See also Names of individual alcohols, FERMENTATION.

ALDEHYDES

SCHMIDT, JUL. Aldehyde- und Keton-Gruppe. *In* Houben, *Meth. org. Chem.*, 3. Aufl., 3: 529-643 (1930). *Bibl. footnotes.*

SCHOU, SVEND A. Structure et activation des molécules des aldehydes aliphatiques. *J. chim. phys.* 26: 89-90 (1929). 52 references.

WAGNER, ALFRED, *editor*. Die Riechstoffe und ihre Derivate. Vol. 5. Part I. Aldehydes of the aliphatic series; Part II. Aldehydes of the alicyclic series; Part III. Aromatic hydroxyaldehydes with saturated side chains — dihydroxyaldehydes — aromatic ether hydroxyaldehydes with saturated and unsaturated side chains — aroxyaldehydes; Part IV. List of patents — Index of patents — Author index and alphabetical subject index. Vienna, Hartleben, 1929-1931. 1431 p. *Bibl. footnotes.*

ALKALOIDS

TRIER, GEORG. Die Alkaloide. 2. Aufl. Berlin, Borntraeger, 1931. 1061 p. Extensive *bibl. footnotes.* (2nd edition of Winterstein-Trier).

See also DIGITIN, ERGOT, MORPHINE, SCOPOLAMINE, STROPHANTHIN, STRYCHNINE.

ALLOYS

BAUER, O. Literatur über ternäre Systeme. Landolt-Börnstein-Roth, Tabellen, 1st suppl.: 238 (1927); 47 references; 2nd suppl.: 319-320 (1931); 62 references.

GILLET, H. W. Some characteristics of light alloys for aircraft. *Aeronautical Eng.* (A. S. M. E. Trans.) 2, no. 3: 120 (1930). 50 references.

See also Names of metals, BEARING METALS, METALLOGRAPHY, METALLURGY.

ALUMINUM

ANDERSON, ROBERT J. Heat treatment of aluminium alloys. *Metals and Alloys* 1: 779-780 (1930). 54 references.

ANDERSON, ROBERT J. Secondary aluminium (Metallurgy, technology, raw materials, production, economics and utilization). Cleveland, Sherwood Press, 1931. 563 p. Selected bibl. at end of each chapter.

BAERWIND, E., and GEWECH, F. Verarbeitung von Ton und andern Aluminium-silicaten, Schlacken. *In* Ullmann, Enzyk. tech. Chem., 2nd ed., 1: 266-267 (1928). Patents.

DOELTER, C. Aluminium. *In his* Handb. Mineralchem. 3, pt. 2: 435-463 (1926). Bibl. footnotes.

EDWARDS, J. D., FRARY, F. C., and JEFFRIES, Z. Aluminum industry. I. Aluminum and its production. 358 p. Bibl. footnotes. Bauxite and laterite, p. 120-123. II. Aluminum products and their fabrication. 870 p. Constitution and structure of Al alloys, p. 121-132. 158 references. Al alloys, p. 183-191. Classified. Commercial Al alloys, p. 264-272. Classified. New York, McGraw-Hill, 1930.

MELCHIOR, PAUL. Aluminium; die Leichtmetalle und ihre Legierungen. Berlin, VDI-Verlag, GmbH, 1929. 280 p. Bibl. in "Vorwort."

OBERMÜLLER, HERMANN. Aluminium-Kokillenguss. Berlin, VDI-Verlag, 1929. 84 p. Bibl., p. 83-84.

STERNER-RAINER, R. Ueber das Auftreten kleiner Mengen von Gasen und Oxyden in Aluminium und in Al-Legierungen. *Z. Metallkunde* 23: 279 (1931). 42 references.

Travail de l'aluminium et des ses alliages; la fonderie. Paris, L'Aluminium français, 1929. 163 p. Bibl., p. 155-158.

ALUMINUM CHLORIDE

KRÄNZLEIN, GEORG. Aluminiumchlorid in der organischen Chemie. Berlin, Verlag Chemie, 1930. 47 p. 179 footnotes.

WURSTER, C. Die technische Gewinnung von wasserfreiem Aluminiumchlorid. *Z. angew. Chem.* 43: 877-880 (1930). 37 footnotes.

ALUMINUM HALIDES *

DOELTER, C. Die Halogenide des Aluminiums. *In his* Handb. Mineralchem. 4, pt. 3: 279-342 (1930). Bibl. footnotes.

ALUMINUM OXIDE

LEITMEIER, H. Tonerdehydrate. *In* Doelter, Handb. Mineralchem. 3, pt. 2: 463-481 (1926). Bibl. footnotes.

ALUMINUM SILICATES

DOELTER, C. Aluminate. *In his* Handb. Mineralchem. 3, pt. 2: 510-532 (1926). Bibl. footnotes.

FESSLER, A. H. Bibliography of literature on $Al_2O_3-SiO_2$ in publications of the American Ceramic Society. *J. Am. Ceram. Soc.* 13: 329-331 (1930). 50 references.

ALUMINUM SULFATE

HLAWATSCH, C. Aluminiumsulfate. *In* Doelter, Handb. Mineralchem. 4, pt. 2: 326-537 (1929). Bibl. footnotes. Includes alums.

AMBER *

SCHMID, LEOPOLD. Bernstein. *In* Doelter, Handb. Mineralchem. 4, pt. 3: 852-858, 883-886, 888, 926-930, 942-943 (1930). 613 references. Also issued as a separate. Dresden, Steinkopff, 1931. 104 p.

AMINES

PFANKUCH, E. Amine (Pharmakologie). *In* Houben, Fortschritte der Heilstoffchemie, Zweite Abt., Bd. I: 1042-1185 (1930). Bibl. footnotes.

SICKEL, HANS. Amine. *In* Abderhalden, Biochem. Handl. 12: 174-209 (1930). Numerous bibl. footnotes.

AMINO ACIDS

MAHN, HERBERT. Aminosäuren die in Eiweiss vorkommen. *In* Abderhalden, Biochem. Handl. 12: 267-749 (1930). Numerous bibl. footnotes.

MAHN, HERBERT. Biologisch interessante Aminosäuren die im Eiweiss nicht vorkommen. *In* Abderhalden, Biochem. Handl. 12: 750-806 (1930). Numerous bibl. footnotes.

PFANKUCH, E. Aminosäuren (Pharmakologie). *In* Houben, Fortschritte der Heilstoffchemie, Zweite Abt., Bd. I: 1086-1287 (1930). Bibl. footnotes.

VICKERY, HUBERT B., and SCHMIDT, CARL L. A. History of the discovery of the amino acids. *Chem. Reviews* 9: 298-318 (1931). 415 references.

See also BIOCHEMISTRY (Peters), Names of individual acids.

AMINOPHENOL *

ALTPETER, J. Die Herstellung von *p*-Aminophenol. Metallbörse 20: 2803-2804 (1930); 21: 27-28 (1931). References through text.

AMMONIA

KOWALKE, OTTO L., HOUGEN, O. A., and WATSON, K. M. Transfer coefficients of ammonia in absorption towers. Univ. Wis., Eng. Expt. Station, Bull. No. 68. 1925. 86 p. Bibl., p. 82-86.

LOEPMANN, B., and MOUTHS, W. Patente betreffs die Gewinnung von Salmiak nach dem Ammoniak-Soda-verfahren. Ber. Ges. Kohlentechnik 3: 135-144 (1930).

MITTASCH, A., and FRANKENBURGER, W. The historical development and theory of ammonia synthesis. J. Chem. Education 6: 2097-2103 (1929). 54 references.

MÜLLER, C. Ammoniak. In Ullmann, Enzykl. tech. Chem., 2nd ed., 1: 349-427 (1928). References through text; bibl. footnotes, p. 383-400; patents, p. 420-426; bibl., p. 426-427.

See also BIOCHEMISTRY (Peters), CATALYSTS (Kausch).

AMMONIUM CHLORIDE

DOELTER, C. Salmiak (Ammoniumchlorid). In his Handb. Mineralchem. 4, pt. 3: 6-31 (1930). Bibl. footnotes.

AMNIOTIC FLUID

ZUNTZ, LEO. Fruchtwasser. In Abderhalden, Handb. Biochem., 2nd ed., 5: 592-610 (1925). 76 footnotes.

AMYL ACETATE. See ACETIC ACID (Bugge).

AMYLASE

CHRZASZCZ, TADEUSZ. Die dextrinierende Kraft der Malzamyase verschiedener Getreidearten und einige Beobachtungen über die Reaktivierung der durch hohe Temperatur inaktivierten Amylase. Biochem. Z. 150: 60-92 (1924). 44 footnotes.

CHRZASZCZ, TADEUSZ. Einfluss der Temperatur auf die Wirkung der Amylase. Biochem. Z. 142: 417-439 (1923). 44 footnotes.

CLEAVELAND, MARION. A quantitative study of the influence of certain neutral salts upon the activity of malt amylase. Thesis, Columbia Univ., 1929. 39 p. Bibl., p. 37-38.

JOSEPHSON, KARL, and SJOBERG, KNUT. Amylasen. In v. Euler, Chemie der Enzyme II, pt. 1: 333-419 (1928). Bibl. footnotes.

PALLADIN, W., and POPOFF, HELENE. Ueber die Entstehung der Amylase und Maltase in den Pflanzen. Bio-

chem. Z. 128: 487-494 (1922). 40 footnotes.

SABALITSCHKA, TH. Amylase. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 1: 891-1070 (1931). Bibl. footnotes.

SJÖBERG, KNUT. Ueber die Bildung und das Verhalten der Amylase in lebenden Pflanzen. Biochem. Z. 133: 218-293 (1922). 60 footnotes.

See also ENZYMES (Hesse), FERMENTATION (Smyth), TAKADIASTASE.

AMYLOID *

LEUPOLD, ERNEST. Amyloid und Hyalin. Ergebnisse allgem. Path. path. Anat. 21: 180-181 (1925). 76 references.

ANALYTICAL CHEMISTRY

BENEDICT, H. C. The polarizing microscope in organic chemistry. Ind. Eng. Chem., Anal. Ed. 2: 92-93 (1930). 32 references.

CATTELAINE, E. Introduction à l'étude de l'électroanalyse. J. pharm. chim. 10: 169-174, 204-213 (1929). Bibl. footnotes; bibl., p. 209-213; 52 references.

DUBSKÝ, J. v. Evolution of elementary organic analysis. Chem. Listy 23: 528-532, 551-554 (1929).

FURMAN, N. HOWELL. Electrometric methods in analytical chemistry. In Taylor, Treatise on Physical Chemistry, 2nd ed., II: 901-947 (1931). Bibl. footnotes.

FURMAN, N. HOWELL. Potentiometric titrations. A review and report of progress. Ind. Eng. Chem., Anal. Ed., 2: 219-224 (1930). 227 references.

GERLACK, WALTHER, and SCHWEITZER, EUGEN. Die chemische Emissions-Spektralanalyse. Leipzig, Voss, 1930. 120 p. Bibl., p. 118-120.

GRANT, JULIUS. Modern organic reagents used for the detection and determination of metals. Ind. Chemist 7: 200, 229-230 (1931). 49 references.

HALL, WM. T. Textbook of quantitative analysis. New York, Wiley, 1930. 279 p. Bibl. footnotes.

HAMMETT, LOUIS P. Solutions of electrolytes, with particular application to qualitative analysis. New York, McGraw-Hill, 1929. 211 p. Bibl. at end of most of the chapters.

HAUROWITZ, FELIX. Biochemische Methodik. In Jahresber. Physiol. exptl. Pharmacol. 7: 179-205 (1926); 9: 138-157 (1928). Bibl. footnotes.

HILLEBRAND, W. F., and LUNDELL, G. E. F. Applied inorganic analysis. New York, Wiley, 1929. 929 p. Bibl. footnotes.

HOLLARD, AUGUSTE, and BERTIAUX, L. Analyse des métaux par électrolyse.

ANALYTICAL CHEMISTRY—Cont'd

- 4th ed. Paris, Dunod, 1930. 232 p. Bibl. footnotes.
- KEMULA, W. Ueber Heyrovsky's elektroanalytische "polarographische" Methode und ihre Anwendung in der theoretischen und praktischen Chemie. *Z. Elektrochem.* 37: 793-795 (1931). 98 references, 1922-1931.
- KEYS, ANCEL B. Determination of chlorides with the highest accuracy. *J. Chem. Soc.* 1931: 2445-2447. 38 references.
- KLEIN, G. Handbuch der Pflanzenanalyse. I. Allgemeine Methoden der Pflanzenanalyse. Vienna, Springer, 1931. 627 p. Bibl. at end of each section.
- KOLTHOFF, I. M., and FURMAN, N. H. Potentiometric titrations. 2d ed. New York, Wiley, 1931. 482 p. Bibl., p. 411-445.
- KOLTHOFF, I. M., and MENZEL, H. Volumetric analysis. II. Practical volumetric analysis. New York, Wiley, 1929. 552 p. Bibl. footnotes.
- LABAT, J. A. *Revue de chimie analytique*. *Rev. gén. sci. pures et appl.* 38: 576-580 (1927).
- MACCHIA, O. La determinazione dei SO_4^{--} nei bagni di cromatura. *Ind. chimica* 5: 1346-1351 (1930). 52 footnotes.
- MACCHIA, O. Metodo di dosaggio volumetrico dei SO_4^{--} . *Ind. chimica* 4: 480-483 (1929). 100 footnotes.
- MEYER, HANS. Analyse und Konstitutionsermittlung organischer Verbindungen. 5. Aufl. Berlin, Springer, 1931. 709 p. Extensive bibl. footnotes.
- MITCHELL, C. A. Recent advances in analytical chemistry. I. Organic chemistry. II. Inorganic chemistry. London, Churchill, 1930-1931. 421 and 452 p. Bibls. through text.
- MOSER, LUDWIG, and BLAUSTEIN, WILHELM. Die Bestimmung und Trennung seltener Metalle von anderen Metallen. XVII. Die Fällung des Wolframs mit Tannin und Antipyrin, seine Trennung von den drei- und zwei-wertigen Metallen, vom Zinn und von der Kieselsäure. *Monatsh.* 52: 351-364 (1929). 49 footnotes.
- NAISH, WM. A., and CLENNELL, JOHN E. Select methods of metallurgical analysis. New York, Wiley, 1930. 495 p. Numerous bibls. through text, arranged by elements.
- PATRIDGE, H. M. Applications of the photo-electric cell to chemical analysis and control. *Ind. Eng. Chem., Anal. Ed.*, 2: 211-213 (1930). 168 references.
- PFEIFFER, HANS. Der gegenwärtige Stand der kolorimetrischen Azidimetrie in der Gewebephysiologie. *Protoplasma* 1: 459-465 (1927). 250 references.
- RAUCH, A. Fortschritte auf dem Gebiete der analytischen Chemie im Jahre 1928. *Fortschrittsber. Chem.-Ztg.* 1929: 101-108. 158 references.
- ROSENTHALER, L. The chemical investigation of plants. London, Bell, 1930. 197 p. Bibl., p. 184-189.
- STAUDINGER, HERMANN. Anleitung zur organischen qualitativen Analyse. 2. Aufl. Berlin, Springer, 1929. 144 p. Bibl. footnotes.
- THURNWALD, H., and HÜTTIG, G. F. Die Grundlagen der quantitativen Spektralanalyse. *Z. anal. Chem.* 76: 271-272 (1929). 24 references.
- WASHINGTON, HENRY S. The chemical analysis of rocks. 4th ed. New York, Wiley, 1930. 296 p. Bibl., p. 278-281.
- WDOWISZEWSKI, H. Progress in analytical chemistry. 1926. *Przemysl Chem.* 13: 53-60 (1929). 1927. 13: 541-552 (1929).
- ZINNADZE, R. Neue Methoden zur kolorimetrischen Bestimmung der Phosphor- und Arsensäure. *Z. Pflanzenernähr., Düngung und Bodenk.* 16: 180-184 (1930). 181 references.

ANALYTICAL CHEMISTRY: Micro Methods.

- BENEDETTI-PICHLER, A. Die Fortschritte in der Mikrochemie in den Jahren 1915 bis 1924. *Mikrochemie* 3: 117-160 (1925); 4: 21-96, 109-127, 202-208 (1926); 5: 30-80 (1927). About 1400 footnotes.
- BENEDETTI-PICHLER, A. Die Fortschritte der Mikrochemie in den Jahren 1915-1926. Vienna, 1927. 305 p. (*i. e.*, 131-436). Books, p. 135-138; bibl. footnotes.
- BENEDETTI-PICHLER, A. Fortschritte in der Mikroanalyse. *Z. angew. Chem.* 42: 954-959 (1929). 37 footnotes.
- EMICH, F. Lehrbuch der Mikrochemie. 2. Aufl. Munich, 1926. 273 p. 924 footnotes.
- EMICH, FRIEDRICH. Mikrochemisches Praktikum. 2. Aufl. Munich, Bergmann, 1931. 157 p. Bibl. footnotes.
- EMICH, F. Ueber die Fortschritte der Mikrochemie. I. Ueber die Fortschritte der Mikrochemie bis zum Jahre 1911. *Mikrochemie* 2: 52-70 (1924). 62 footnotes. II. Die Fortschritte in der Mikrochemie in den Jahren 1911 und 1912. *Mikrochemie* 2: 193-196 (1924); 3: 21-31, 60-63, 84-91 (1925). 162 footnotes. III. Die Fortschritte der Mikrochemie in den Jahren 1913 und 1914. *Mikrochemie* 3: 92-116 (1925). 163 footnotes.

FEIGL, FRITZ. Katalyse und Mikrochemie. *Mikrochemie* 10: 296-305 (1931). 36 footnotes.

FEIGL, FRITZ. Qualitative Analyse mit Hilfe von Tüpfelreaktionen. Leipzig, Akad. Verlagsges., 1931. 387 p. Bibl. footnotes.

FEIGL, F. Tüpfelreaktionen. *Mikrochemie* 8: 356-374 (1930). References classified by elements.

HELLER, KURT, *et al.* Die Alkalimetalle. *Mikrochemie* 8: 182-206 (1930). References through text.

KLEIN, G., and STREBINGER, R. Fortschritte der Mikrochemie in ihrer verschiedenen Anwendungsgebieten. Leipzig, Deuticke, 1928. 436 p. Bibl. footnotes.

STEIDLER, FRANZ. Ueber mikrochemische Reaktionen des Zirkoniums und einiger verwandten Elemente. *Mikrochemie* 2: 131-156 (1924). 32 footnotes.

TUNMANN, O., and ROSENTHALER, L. Pflanzenmikrochemie. 2. Aufl. Berlin, Borntraeger, 1931. 1047 p. Bibl. footnotes.

See also IODINE (Lunde).

ANAPHYLAXIS

BESREDKA, ALEXANDRE. Le choc anaphylactique et le principe de la désensibilisation. Paris, Masson, 1930. 275 p. Bibl. footnotes.

COCOA, A. F., *et al.* Asthma and hay fever in theory and practice. I. Hypersensitiveness. II. Asthma. III. Hay fever. Springfield, Ill., Thomas, 1931. 851 p. Bibl., p. 107-114; 376 references; p. 463-484; 1077 references; p. 783-786; 628 references.

LAROCHE, GUY, RICHET, CHARLES, and SAINT-GIRONS, FRANÇOIS. Alimentary anaphylaxis (gastro-intestinal food allergy). Berkeley, Univ. Calif. Press, 1930. 139 p. Bibl., p. 132-139.

NICCOLINI, P. M. L'iodiosincrasia. *Arch. intern. pharmacodyn. therapie* 35: 323-365, 424-459 (1929). 180 footnotes.

Serum-anaphylaxis. Index-Cat., S. G. O., 3rd ser., 9: 563-564 (1931).

ANEMIA

BEARD, HOWARD H., and MYERS, VICTOR C. Nutritional anemia of the rat. I. Influence of iron on blood regeneration. *J. Biol. Chem.* 94: 87-88 (1931). 42 references.

CONNER, H. M. Recent American literature on the treatment of experimental and secondary anemia by methods other than transfusion. *Folia Hematol.* 37: 464-466 (1928). 41 references.

DAVIDSON, LEYBOURNE S. P., and GUL-
LAND, GEORGE L. Pernicious anemia. St. Louis, Mosby Co., 1930. 293 p. Bibl., p. 279-288.

ISAACS, R. Study of pernicious anemia in America in 1927. *Folia Hematol.* 37: 108-111 (1928).

ISAACS, R., and MINOT, G. R. Pernicious anemia (American literature for 1928). *Folia Hematol.* 41: 185-188 (1930). 68 references.

JEDLIČKA, VLADIMIR. Perniciosní anemie. V Praze, Nákladem České akademie věd a umění, 1929. 288 p. Bibl., p. 259-288.

MACKAY, HELEN M. W. Nutritional anemia in infancy, with special reference to iron deficiency. Medical Research Council (Gt. Brit.), Special Report Series No. 157. 1931. 125 p. Bibl., p. 122-125.

MEYERS, VICTOR C., and BEARD, HOWARD H. Nutritional anemia of the rat. II. Influence of iron plus supplements of other inorganic elements upon blood regeneration. *J. Biol. Chem.* 94: 109-110 (1931). 40 references.

MOMBURG, FRITZ. Die künstliche Blutleere. Stuttgart, Enke, 1922. 89 p. Bibl., p. 87-89.

MULLER, GUILLI L. Relation of cholesterol, lecithin phosphorus and fatty acids to the remission of pernicious anemia. *Am. J. Med. Sci.* 179: 335-337 (1930). 76 references.

SMITH, SYBIL L. Nutritional anemia. *J. Home Econ.* 22: 471-474 (1930). 51 references.

VAUGHAN, JANET M. Liver treatment of anemia. *Quart. J. Med.* 23: 230-232 (1930).

ZADEK, I. Arbeiten aus der deutschen Literatur über Anämien. *Folia Hematol.* 35: 291-294 (1927). 77 references. 37: 457-458 (1928). 40 references. 40: 193-197 (1930). 111 references.

ANESTHETICS

BANCROFT, WILDER D., and RICHTER, GEORGE H. The chemistry of anesthesia. *J. Phys. Chem.* 35: 215-268 (1931). Bibl. footnotes.

BRUNN, MAX VON. Die Lumbalanästhesie. Stuttgart, Enke, 1922. 186 p. Bibl., p. 177-186.

FISCHER, GUIDO. Localanästhesie. Fortschritte der Zahnheilkunde 6: 83-85 (1930); 7: 92-94 (1931).

HÄRTEL, FRITZ. Die Lokalanästhesie. Stuttgart, Enke, 1916. 266 p. Bibl., p. 259-266.

ANESTHETICS—Cont'd

- HENDERSON, V. E. Anaesthetic toxicity. Arch. intern. pharmacodyn. thérapie 38: 163-165 (1930). 80 references.
See also CHLOROFORM, ETHER, NITROUS OXIDE, PHARMACEUTICALS (Munch).

ANHYDRITE.* *See* CALCIUM CARBONATE.**ANISALDEHYDE**

- ANISALDEHYD. *In* Wagner, Die Aldehyde, 1930: 826-856. 130 footnotes.

ANODYNES.* *See* PHARMACEUTICALS (Munch).**ANTHELMINTICS**

- NEELY, J. S., and DAVY, E. D. The anthelmintic properties of Pepo U. S. P. and Cucurbita pepo. J. Am. Pharm. Assocn. 20: 557-558 (1931). 34 references.
See also PHARMACEUTICALS (Munch).

ANTHOCYANS

- DEKKER, J. Die Anthocyane. *In* Houben, Meth. org. Chem., 3d Aufl., 3: 1009-1059 (1930). Bibl. footnotes.
See also PIGMENTS.

ANTHRACENE

- ALTPETER, J. Die Gewinnung des Anthracens und Carbazols. Metallbörse 19: 1686-1688 (1929). Patent review.

ANTIGENS

- DE POTTER, FRANZ. Sur les propriétés antigènes et réactionnelles des tuberculines. Arch. intern. pharmacodyn. thérapie 33: 178-185 (1927). 125 references.
 SACHS, HANS. Antigene und Antikörpern. *In* Oppenheimer, Handb. Biochem., 2. Aufl., 3: 1-90 (1925). 350 references.
 SACHS, HANS. Antigenstruktur und Antigenfunktion. Ergebnisse Hygiene, Bakteriologie, Immunitätsforschung u. exptl. Therapie 9: 45-53 (1928).
 THOMSEN, OLUF. Antigener i belysning af de senere aars undersøgelser. Copenhagen, B. Lunos bogtrykkeri, 1929. 147 p. Bibl., p. 124-147.
See also IMMUNITY.

ANTIMONY

- M McNABB, WALLACE M., and WAGNER, E. G. Evaluation of stibnite. II. Determination of antimony. Ind. Eng. Chem., Anal. Ed., 2: 255-256 (1930). 44 references.

ANTIPIRETTICS. *See* PHARMACEUTICALS (Munch).**ANTISEPTICS**

- HOWARD, R. C., ROCKWELL, G. E., and CRIST, W. L. Study of the antiseptic value of chlorine with reference to animal skin disinfection. J. Am.

Leather Chem. Assoc. 24: 472-479 (1929). 134 references.

- LANDON, H. M. Emulsified antiseptics, disinfectants and allied substances. Ind. Chemist 7: 244 (1931). 23 references.

See also DISINFECTANTS.

APPLES

- ARCHBOLD, H. K. Chemical studies in the physiology of apples. IX. The chemical composition of mature and developing apples and its relationship to environment and to the rate of chemical change in store. Ann. Bot. 42: 566 (1928). 23 references.
 EVANS, D. I. Chemical studies in the physiology of apples. VII. Study of the sugars of apples with especial reference to the fructose-glucose ratio. Ann. Bot. 42: 27-28 (1928). 25 references.
 HAYNES, D., and ARCHBOLD, H. K. Chemical studies in the physiology of apples. X. A quantitative study of chemical changes in stored apples. Ann. Bot. 42: 1016-1017 (1928). 24 references.
 HOWLETT, FREEMAN S. The nitrogen and carbohydrate composition of the developing flowers and young fruits of the apple. Cornell Univ. (N. Y.) Agr. Expt. Sta., Memoir 99. 1926. 79 p. Bibl., p. 52-54.
 ROBERTS, R. H. Apple physiology; growth, composition and fruiting responses in apple trees. Wis. Agr. Expt. Sta., Research Bull. 68: 68-72 (1926).
ARGININE
 MAHN, HERBERT. Arginin. *In* Abderhalden, Biochem. Handl. 12: 511-538 (1930). Bibl. footnotes.
ARSENIC: Analytical
 KLEINMANN, HANS, and PANGRITZ, FRITZ. Eine nephelometrische Methode zur Bestimmung kleiner Arsenmengen. Biochem. Z. 185: 14-43 (1927). 35 footnotes.
ARSENIC: Organic Compounds.
 BAUER, H., and BENDA, L. Chemie der organischen Arsenverbindungen. *In* Kollé and Zieler, Handbuch der Salvarsantherapie I: 447-474; patents, I: 474-484 (1924).
 GODDARD, ARCHIBALD EDWIN. Organometallic compounds. II. Derivatives of arsenic. London, Griffin, 1930. 605 p. Bibl. footnotes. Contains patent index. (Friend, Textbook of Inorg. Chem., Vol. XI.)
ARSPHENAMINE
 Neosalvarsan. Index-Cat., S. G. O., 3rd ser., 8: 46-47 (1929). 45 references.

Salvarsan. Index-Cat., S. G. O., 3rd ser., 9: 365-367 (1931).

See also ARSENIC: ORGANIC COMPOUNDS, CHEMOTHERAPY.

ASBESTOS

GAMBLE, WILLIAM B. Asbestos. New York Public Library, Bull. 33: 664-687, 756-769, 806-835 (1929). Reprinted, 1929. 72 p. 1594 references and patents. Annotated.

HALL, A. L. Asbestos in the Union of South Africa. 2d ed. South Africa, Geol. Survey, Memoir No. 12. 1930. 324 p. Bibl., p. 284-288.

ROSS, JAMES G. Chrysotile asbestos in Canada. Canada, Dept. of Mines, Mines Branch, No. 707. 1931. 146 p. Bibl., p. 133-139.

WILSON, ELDRED D. Asbestos deposits of Arizona; with an introduction on asbestos minerals, by G. M. Butler. Arizona, State Bur. of Mines, Bull. No. 126. 1928. 100 p. Bibl. footnotes.

ASPARAGIN

MAHN, HERBERT. Asparagin. In Abderhalden, Biochem. Handl. 12: 472-486 (1930). Bibl. footnotes.

ASPARTIC ACID

MAHN, HERBERT. Asparaginsäure. In Abderhalden, Biochem. Handl. 12: 457-472 (1930). Bibl. footnotes.

ASPHALT

ABRAHAM, H. Asphalts and related substances. 3rd ed. New York, Van Nostrand, 1929. 891 p. Bibl., p. 853-858; also at the end of chapters.

KISSLING, RICHARD. Chemisch-technische Fortschritte auf dem Gebiete der Asphalt- und Teerindustrie. Asphalt u. Teer 30: 595-599 (1930). Bibl. through text.

LEEMANS, E. T. Asphalt-emulsies. Chem. Weekblad 26: 2-6 (1929). Many patents given in the footnotes.

NELLENSTEYN, P. I. De bouw van het asphaltnicel. Chem. Weekblad 24: 414-421 (1927). 36 footnotes.

SINGER, L. Asphaltherstellung und -verwendung. Petroleum 25: 1011-1015 (1929). 85 footnotes.

VON SKOPNIK, ALBRECHT. Asphalte. In Doelter, Handb. Mineralchem. 4, pt. 3: 603-644 (1930). Bibl. footnotes.

See also PAPER (Rossman).

ASSAYING

FULTON, CHARLES H., and SHARWOOD, WILLIAM J. A manual of fire assaying. 3rd ed. New York, McGraw-Hill, 1929. 268 p. Bibl. footnotes.

ATMOSPHERE

SCHMAUSS, AUGUST, and WIGAND, ALBERT. Die Atmosphäre als Kolloid.

Braunschweig, Vieweg, 1929. 74 p. Bibl., p. 66-69.

See also AIR.

ATOMIC THEORY

BRUNOLD, CHARLES. Le problème de l'affinité chimique et l'atomistique. Paris, Masson, 1930. 118 p. Bibl., p. 113-115.

DARROW, KARL K. Statistical theories of matter, radiation and electricity. Phys. Rev. Suppl. 1: 154-155 (1929).

THOMSON, GEORGE P. The atom. London, Butterworth, 1930. 252 p. Bibl. of books in English, p. 245-247.

ATOPENS *

COCOA, A. F., et al. Asthma and hay fever in theory and practice. Springfield, Ill., Thomas, 1931. 851 p. Bibl., p. 783-796; 628 references. Contains 147 references on atopens.

AUTOLYSIS

HERZER, RUDOLF. Ueber den Ablauf der postmortalen Autolyse und Proteolyse im Organbrei röntgenbestrahlter Meerschweinchen. Biochem. Z. 184: 358 (1927). 45 references.

AZEOTROPIC MIXTURES *

SUNIER, ARTHUR A., and ROSENBLUM, CHARLES. Physical methods of separating constant-boiling mixtures. Ind. Eng. Chem., Anal. Ed. 2: 113 (1930). 43 references.

AZOXY COMPOUNDS

BIGELOW, H. E. Azoxy compounds. Chem. Reviews 9: 164-167 (1931). 151 references.

BACTERIA

BORTELS, HERMAN. Ueber die Bedeutung von Eisen, Zink und Kupfer für Mikroorganismen. Biochem. Z. 182: 357-358 (1927). 73 references.

BREDEMANN, G. Bacillus amylobacter A, M, et Bredemann in morphologischer, physiologischer und systematischer Beziehung, mit besonderer Berücksichtigung des Stickstoffbindungsvermögens dieser Spezies. Centr. Bakt., Parasitenk., II Abt., 23: 539-566 (1909). 225 references.

BUCHANAN, R. E., and FULMER, ELLIS I. Physiology and biochemistry of bacteria. Baltimore, Williams and Wilkins, 1928-1930. 3 vols. Bibl., vol. 1: 463-493; vol. 2: 557-669; vol. 3: 407-540.

DERNBY, K. G., and NÄSLUNG, CARL. Biochemische Studien über Tuberkelbacillen. Biochem. Z. 132: 411 (1922). 35 references.

DERNBY, K. G., and SIWE, STURE. Die proteolytischen Enzyme der Diphtheriebazillen und ihre Bedeutung für

BACTERIA—Cont'd

das Wachstum und die Toxinbildung derselben. *Biochem. Z.* 134: 19 (1922). 40 references.

DOWNS, CORNELIA M. Antigenic and metabolic studies of *Bacillus typhosus*. *Univ. Kansas Sci. Bull.* 16: 86-89 (1926). 162 references.

FROST, WM. D., and HANKINSON, HAZEL. *Lactobacillus acidophilus*, an annotated bibliography. Milton, Wis., Davis-Green Corp., 1931. 160 p.

FULMER, E. I., and WERKMAN, C. H. An index to the chemical action of microorganisms on the non-nitrogenous organic compounds. Springfield, Ill., Thomas, 1930. 198 p. *Bibl.*, p. 167-198.

GEILINGER, HANS, and SCHWEIZER, KARL. Ueber das Wesen der Neutralrotreaktion in Bakterienkulturen. *Biochem. Z.* 138: 118 (1923). 37 references.

HALL, IVAN C. Review of the development and application of physical and chemical principles in the cultivation of obligately anaerobic bacteria. *J. Bact.* 7: 290-301 (1929).

HERMANN, S., and NEUSCHUL, P. Zur Biochemie der Essigbakterien. *Biochem. Z.* 233: 214, 216 (1931). 28 references.

KAYSER, EDMOND. *Microbiologie appliquée à la transformation des produits agricole*. 5th ed. Paris, Bailliére et fils, 1931. 488 p. *Bibl.*, p. 479-481.

KENDALL, A. I. Bacterial metabolism. *Arch. Path.* 12: 95-114 (1931). 40 footnotes.

KRASNOW, FRANCES, RIVKIN, HELEN, and ROSENBERG, MARGARET L. Method of studying the availability of synthetic media for streptococci. *J. Bact.* 12: 405-408 (1926). 100 references.

KRASNOW, FRANCES, and ROSENBERG, MARGARET L. Biochemical studies of streptococci. II. Availability of 671 synthetic media. *J. Dental Research* 9: 123-169 (1929). 82 references.

LEVINE, M., and SCHOENLEIN, H. W. A compilation of culture media for the cultivation of microorganisms. Baltimore, Williams and Wilkins, 1930. 969 p. *Bibl.*, p. 915-969.

METZNER, P. Ueber die Wirkung photodynamischer Stoffe auf *Spirillum volutans* und die Beziehungen der photodynamischen Erscheinung zur Phototaxis. *Biochem. Z.* 101: 51-53 (1919). 28 references.

PETERSON, W. H., PRUESS, L. M., and FRED, E. B. The proteolytic action of certain lactic acid bacteria. *J. Bact.* 15: 176-178 (1928). 30 references.

RIVERS, T. M. Filterable viruses. *J. Bact.* 14: 243-257 (1927). 410 references.

SHAUGHNESSY, H. J., and WINSLOW, C. E. A. The diffusion products of bacterial cells as influenced by the presence of various electrolytes. *J. Bact.* 14: 97-99 (1927). 50 references.

SLANETZ, CHARLES A., and RETTGER, LEO F. Bacterial metabolism. The influence of phosphate buffer in carbohydrate-free and in glucose-containing media. *J. Bact.* 15: 316-317 (1928). 26 references.

SMYTH, HENRY F., and OBOLD, WALTER L. Industrial microbiology. Baltimore, Williams and Wilkins, 1930. 313 p. *Bibls.* at end of chapters.

STEPHENSON, M. Bacterial metabolism. New York, Longmans, 1930. 320 p. *Bibl.*, p. 279-310.

TAMIYA, H. Studien über die Stoffwechselphysiologie von *Aspergillus oryzae*. *Acta Phytochim.* 3: 51-173 (1927). 119 footnotes.

TAMIYA, HIROSHI, and MORITA, SHIN-KICHI. Bibliography of *Aspergillus*, 1729-1928. *Botanical Mag. (Tokyo)* 43, no. 506, to 44, no. 524 (1929-1930). 204 p. 2424 paper; chronological.

THOM, CHARLES. The Penicilla. Baltimore, Williams and Wilkins, 1930. 644 p. *Bibl.*, p. 601-624. Includes biochemistry and industrial applications.

THOM, CHARLES, and CHURCH, MARGARET B. The Aspergilli. Baltimore, Williams and Wilkins, 1926. 272 p. *Bibl.*, p. 253-261. Includes biochemistry and industrial applications.

VALLEY, GEORGE. Effect of carbon dioxide on bacteria. *Quart. Rev. Biol.* 3: 221-224 (1928). 110 references.

VALLEY, GEORGE, and RETTGER, LEO F. The influence of carbon dioxide on bacteria. *J. Bact.* 14: 135-137 (1927). 44 references.

WELLS, H. G. Chemistry of bacteria and their products. *In his Chemical Pathology*, 5th ed., 91-122 (1925). 244 footnotes.

WILSON, P. W., and PETERSON, W. H. The energetics of heterotrophic bacteria. *Chem. Reviews* 8: 478-480 (1931). 73 references.

WINSLOW, C. E. A., and DOLLOF, A. F. Relative importance of additive and antagonistic effects of cations upon bacterial viability. *J. Bact.* 15: 90-92 (1928). 48 references.

BACTERIOPHAGE

BURNETT, F. M. Bacteriophage and cognate phenomena. *In Medical Research Council (Gt. Brit.), System of Bacteriology in Relation to Medicine*, 7: 507-509 (1930).

BAKING

MOHS, KARL. Mehlchemie; neue Erkenntnisse auf dem Gebiete der Mülerei und Bäckerei. Dresden, Steinkopff, 1927. 225 p. Bibl., p. 199-208.

BARIUM OXIDE

ASKENASY, PAUL, and ROSE, RUDOLF. Ueber die Erzeugung von Bariumoxyd aus Bariumcarbonat. Z. anorg. allgem. Chem. 189:8-9 (1930). 51 references.

BARIUM SULFATE

DOELTER, C. Baryt. In Doelter, Handb. Mineralchem. 4, pt. 2: 227-252 (1929). Bibl. footnotes.

BATTERIES *

FÉRY, CHARLES, CHENEVEAU, CHARLES, and PAILLARD, GASTON. Piles primaires et accumulateurs. Paris, Bailière, 1925. 684 p. Bibl., p. 653-654; recent patents, p. 655-662.

See also STORAGE BATTERIES.

BAUXITE

DITTLER, E. Bauxite und Laterit. In Doelter, Handb. Mineralchem. 3, pt. 2: 481-510 (1926). Bibl. footnotes.

FOX, C. A. Bauxite and aluminous laterite occurrences of India. Memoirs Geol. Survey India 49: 222-287 (1923).

BEARING METALS *

CORSE, W. M. Bearing metals and bearings. New York, Chem. Cat. Co., 1930. 383 p. Part II: Bibliography—Literature references from 1900 to 1928 inclusive. 1073 references. Part III: Abstracts of 234 selected papers.

BENCE-JONES PROTEIN

MARCOVICI, EUGENE E. Primary multiple myeloma with Bence-Jones protein in the pleural effusion. Ann. Internal Med. 2: 907-911 (1929). 120 references.

WILLHEIM, R. Zur Frage der Eiweisskörper mit Bence-Jonesscher Reaktion. Biochem. Z. 180: 246 (1927). 30 references.

BENTONITE

BONNE, C. A. Recent work on bentonite. Reprint and Circular Series, National Research Council, 85: 17 (1928); 98: 75-76 (1931). 22 references.

SPENCE, HUGH S., and LIGHT, MARGARET. Possible industrial applications for bentonite. Canada, Dept. Mines, Mines Branch, No. 723 (Investigation of mineral resources and the mining industry). 1931. Classified list of bentonite patents (United

States and Canada), p. 18-31; bibl., p. 32-34 (supplement to bibl. in Publ. No. 626).

BENZALDEHYDE

Benzaldehyd. In Wagner, Die Aldehyde, 1929: 503-564. 309 footnotes.

BENZANTHRONE *

MARTINET, J., and DROBATSCHKEFF, A. Benzantrones. Chimie et industrie 21: 227-242, 1149-1160 (1929). 95 references, mainly patents.

BENZENE. See BENZOLE, CRYSTAL STRUCTURE (Lonsdale).**BENZOIC ACID**

QUICK, ARMAND J. The conjugation of benzoic acid in man. J. Biol. Chem. 92: 84-85 (1931). 54 references.

BENZOLE *

HOFFERT, W. H., and CLAXTON, G. Motor benzol; its production and use. London, National Benzole Assoc., 1931. 689 p. Bibl. footnotes.

NATIONAL BENZOLE ASSOCIATION. Bibliography for 1929. In Seventh Report, Joint Benzole Com., Nat. Benzole Assoc. and Univ. Leeds. London, 1930, p. 124-144.

BERYLLIUM

Beryllium. Gmelins Handb. anorg. Chemie. 8th ed. System-nummer 26. 1930. 180 p. Covers literature to May 1, 1930.

MARCHAL, G. La découverte, la préparation, les propriétés et les applications de glucinium. Chimie et industrie 22: 1092; 23: 33 (1929-1930). 42 references.

MIGLIACCI, D. Il berillio. Giorn. chim. ind. appl. 12: 23-27, 83-87 (1930). 109 footnotes.

SIEMENS and HALSE, A. G. Beryllium-Arbeiten. Wissenschaftliche Veröffentlichungen aus dem Siemens-Konzern, VIII, No. 1. Berlin, Springer, 1929. 256 p. "References are numerous."

BEVERAGES

PIQUE, RENÉ. Évolution des boissons chez les peuples anciens. Chimie et industrie, Special No.: 813-824 (Mar., 1931).

See also CACAO, COFFEE, TEA, WINE, etc.

BILE

FOX, F. W. Composition of human bile and its bearing upon sterol metabolism. Quart. J. Med. 21: 121 (1927). 36 references.

GREENE, C. H., WALTHERS, W., and FREDRICKSON, C. H. Composition of the bile following the relief of biliary

BILE—Cont'd

- obstructions. *J. Clinical Investigation* 9: 309-310 (1930). 29 references.
 HORRALL, O. H. Toxicity of bile. *Physiol. Rev.* 11: 137-142 (1931). 106 references.

BILE PIGMENTS

- KÜSTER, WM. Gallenfarbstoffe und Abbauprodukte des Bilirubins. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 321-350 (1921). Bibl. footnotes.
 LEPEHNE, G. Das Problem der Gallenfarbstoffbildung innerhalb und ausserhalb der Leber. *Folia Hematol.* 39: 362-366 (1929-1930). 241 references.
See also URINE.

BILIRUBINEMIA

- BARRON, E. S. G. Bilirubinemia. *Medicine* 10: 126-133 (1931). 290 references.
 FIESSINGER, N., and WALTER, H. La bilirubimétrie plasmatique. *Nutrition* 1: 256-260 (1931). 75 references.

BIOCHEMISTRY

- ABDERHALDEN, EMIL. Lehrbuch der physiologischen Chemie. 6. Aufl. Berlin, Urban und Schwarzenberg, 1931. 852 p. Bibl. at end of each of the 38 chapters.
 BAMANN, EUGEN. Ueber das Asymmetrieproblem in der Biochemie. *Arch. Pharm.* 269: 356-367 (1931). 35 footnotes.
 BÉLEHRÁDEK, J. Temperature coefficients in biology. *Biol. Reviews Cambridge Phil. Soc.* 5: 55-58 (1930).
 Biochemie. *In* Jahresber. *Physiol. exptl. Pharmacol.* 1: 363-398; 2: 33-65; 3: 601-643; 4: 39-83; 5: 833-898; 6: 54-129; 7: 1054-1118; 8: 51-105; 9: 917-968; 10: 50-100 (1920-1929). An extensive bibl.
 Biochemie. *In* Jahresber. *wiss. Biol.* 1: 53-65; 2: 49-62; 3: 50-69; 4: 47-64 (1926-1929). Contains papers selected from 1600 periodicals.
 Biology. *In* *Tables Annuelles* 6: 1354-1399 (1928); 7: 1605-1671 (1930). References through text.
 BODANSKY, MEYER. Introduction to physiological chemistry. 2d ed. New York, Wiley, 1930. 542 p. Bibl. footnotes.
 CAMERON, A. T. A textbook of biochemistry for students of medicine and science. London, Churchill, 1928. 463 p. Bibls. at end of chapters.
 CHILD, C. M. Physiological gradients. *Protoplasma* 5: 470-476 (1929).
 CHIRAY, MAURICE. Étude biochimique et thérapeutique des cholestyctites chroniques. *Assoc. médecins de langue française III*: 125-130 (1930).
 DIXON, M. Oxidation mechanisms in animal tissues. *Biol. Rev. Cambridge Phil. Soc.* 4: 395-397 (1929).
 FÜRTH, OTTO. Lehrbuch der physiologischen und pathologischen Chemie. Leipzig, Vogel, 1925-1928. 2 vols. Bibl. footnotes.
 GORTNER, ROSS AIKEN. Outlines of biochemistry; the organic chemistry and the physico-chemical reactions of biologically important compounds and systems. New York, Wiley, 1929. 792 p. Bibl., p. 735-742.
 GRASSER, GEORG. Chemie und chemische Technologie tierischer Stoffe. Stuttgart, Enke, 1931. 272 p. Brief bibl. at end of each section.
 HAUROWITZ, FELIX. Biochemie. *In* Jahresber. *Physiol. exptl. Pharmacol.* 7: 206-265 (1926); 9: 158-213 (1928). Bibl. footnotes.
 KRÜGER, PAUL. Abstammung und Biochemie. *Biol. generalis* 6: 508-510 (1930).
 KÜSTER, W. Biochemie. *In* Jahresber. *Physiol. exptl. Pharmacol.* 1: 99-122 (1920); 3: 105-147 (1922); 5: 125-176 (1924). Bibl. footnotes.
 LIECHT, ADOLF. Zur Beeinflussung von bioelektrischen Potentialdifferenzen durch die Röntgenstrahlen. *Biochem. Z.* 171: 255 (1926). 41 references.
 MACLEOD, J. J. R. Physiology and biochemistry in modern medicine. 6th ed. St. Louis, Mosby, 1930. 1074 p. Bibl. at end of some of the chapters.
 MATHEWS, ALBERT P. Physiological chemistry. 5th ed. New York, Wood, 1930. 1233 p. References at the end of some of the chapters.
 MEYERHOF, OTTO. Die chemischen Vorgänge im Muskel und ihr Zusammenhang mit Arbeitsleistung und Wärmebildung. Berlin, Springer, 1930. 350 p. Bibl., p. 319-342.
 NEEDHAM, DOROTHY M. Chemical changes during the metamorphosis of insects. *Biol. Rev. Cambridge Phil. Soc.* 4: 326 (1929). 43 references.
 PETERS, JOHN P., and VAN SLYKE, DONALD D. Quantitative clinical chemistry. I. Interpretations. Baltimore, Williams and Wilkins, 1931. 1264 p. Total metabolism, p. 60-69; 208 references. Carbohydrates, p. 193-217; 481 references. Lipoids, p. 254-265; 219 references. Non-protein nitrogen and nitrogen metabolism, p. 323-334; 251 references. Urea, p. 366-369; 71 references. Ammonia, p. 379-383; 81 references. Amino acids, p. 402-407; 104 references. Uric acid,

- p. 446-454; 184 references. Creatine and creatinine, p. 463-467; 86 references. Total organic acids, p. 472-473, 482-485, 505-509; 202 references. Phenols, p. 516-517; 26 references. Hemoglobin and oxygen, p. 636-652; 323 references. Proteins of the urine, blood plasma and other body fluids, p. 713-724; 218 references. Volume of the circulating blood, p. 745-750; 105 references. Total base, sodium and potassium, p. 795-804; 169 references. Calcium, p. 845-861; 324 references. Magnesium, p. 865-867; 36 references. Carbonic acid and acid-base balance, p. 1002-1018; 308 references. Chlorides, p. 1076-1089; 249 references. Phosphorus, p. 1136-1149; 258 references. Sulfur, p. 1167-1172; 105 references.
- PETTIBONE, CHAUNCEY J. V. Pettibone's textbook of physiological chemistry. 4th ed. St. Louis, Mosby, 1929. 368 p. Bibl., p. 354-358.
- Physikalische und chemische Grundlagen der Lebensvorgänge. Jahresber. wiss. Biol. 1: 39-82; 2: 34-74; 3: 38-82 (1926-1928). Covers references from about 1600 journals.
- Physiology and vegetable chemistry. In *Tables Annuelles* 6: 1400-1442 (1928). References through text.
- POWERS, EDWIN B. The relation between pH and aquatic animals. *Am. Naturalist* 64: 363-366 (1930). 45 references.
- PRYDE, JOHN. Recent advances in biochemistry. 2d ed. Philadelphia, Blakiston's, 1928. 379 p. References at end of chapters.
- RICHTER-QUITTNER, M. Die Bedeutung der Quellung und Entquellung für einige Fragen der Biochemie. *Biochem. Z.* 121: 292 (1921). 39 references.
- RONA, PETER. Praktikum der physiologischen Chemie. I. Fermentmethoden. 2. Aufl. 1931. 420 p. II. Blut. Harn. 1929. 764 p. III. Stoffwechsel. 1928. 764 p. Berlin, Springer. Bibl. footnotes.
- STROHL, A. Leçons de physico-chimie à l'usage des médecins et des biologistes. Paris, Masson, 1930. 282 p. Contains bibls.
- TADOKORO, TETSUTARO. Sex differences from the standpoint of biochemistry. *J. Faculty Sci., Hokkaido Imp. Univ., Ser. 3*, 1: 175-179 (1930). 202 references.
- WILLIAMS, ROGER J. An introduction to biochemistry. New York, Van Nostrand, 1931. 501 p. References at end of most of the chapters.
- BIOS**
MILLER, W. L. Bios. *J. Chem. Education* 7: 257-267 (1930). 46 footnotes.
- BISMUTH**
VON OETTINGEN, W. F. The absorption, distribution and excretion of bismuth. *Physiol. Rev.* 10: 278-281 (1930). 133 references.
U. S. Bureau of Standards. Bismuth. *Bur. Standards, Circ. No. 382*. 41 p. 1930. Bibl., p. 31-41. 246 references.
- BITUMENS**
ALADIN, —. Technisch verwendbare Emulsionen, mit besonderer Berücksichtigung der bituminösen Emulsionen. Berlin, Allgem. Industrie-Verlag, 1924. 314 p. Classified patent bibl.
VON SKOPNIK, A. Die Entwicklung der deutschen technischen Emulsionspatente für den bituminösen Strassenbau. *Teer u. Bitumen* 28: 581-585 (1930). Patent review.
See also EMULSIONS.
- BLAST FURNACE**
First report on blast furnace plant and practice. *J. Iron Steel Inst.* 119: 70-73 (1929).
See also IRON AND STEEL.
- BLEACHING**
DAVIDSOHN, J. Die Bleichung der Oele, Fette, Wachse und Seifen. Berlin, Borntraeger, 1931. 269 p. Bibl. footnotes. Patent lists on p. 27-28, 60-61, 79, 102-104, 107-108, 112-117.
RAUCHBERG, HERBERT. Chlorgasbleiche und Chlorkalkbleiche des Sulfitzellstoffes. *Papierfabr.* 29: 490-497, 516-524, 535-541 (1931). 102 bibl. footnotes.
- SOCIETY OF CHEMICAL INDUSTRY. Bleaching, dyeing, printing and finishing. In *Annual reports on the progress of applied chemistry* 14: 155-176 (1929); 246 footnotes. 15: 170-191 (1930); 125 footnotes.
See also DECOLORIZING AGENTS.
- BLOOD**
AWDEJEW, M. S., *et al.* Die chemischen und physikalisch-chemischen Eigenschaften des Blutes beim Rinde, ihre Schwankungen und individuellen Unterschiede. *Tierzüchtung und Züchtungsbiol.* 19: 149 (1930). 40 references.
- BERNDT, ERHARD. Chemisch-physikalische Blutuntersuchung, ihr Wert für die Beurteilung der Konstitution und Leistungsfähigkeit. *Tierernährung und Tierzucht* 1: 735-740 (1929).
- BERNSTEIN, ALEXANDER. Ueber den Einfluss des Nahrungsregimes auf den Katalasegehalt im Blute. *Biochem. Z.* 179: 325 (1926). 31 references.

BLOOD—Cont'd

- Blut. In Jahresber. Physiol. exptl. Pharmakol. 1: 622-664; 2: 352-404; 3: 943-1006; 4: 398-471; 5: 1242-1309; 6: 462-529; 7: 1362-1434; 8: 296-366; 9: 1160-1223; 10: 314-371 (1920-1929). Complete bibl. for these years.
- DEUTSCHBERGER, OTTO. Ueber die an der Zusammensetzung des Restkohlenstoffs und des Reststickstoffs beteiligten Verbindungen, insbesondere die Oxyproteinsäuren im Blute. Biochem. Z. 198: 268-295 (1928). 36 footnotes.
- DONOVAN, HUGH, and BRENNER, O. Influence of the intravenous injection of urea on the exchange of substances between the blood and the tissues. Brit. J. Exptl. Path. 11: 437-438 (1931). 75 references.
- EWIG, W., and WIENER, R. Der Einfluss einer einmaligen maximalen Anstrengung auf die chemische Blutzusammensetzung. Z. ges. exptl. Med. 61: 588-589 (1928). 55 references.
- FALTA, W., and RICHTER-QUITTNER, M. Ueber die Verteilung des Zuckers, der Chloride und der Reststickstoffkörper auf Plasma und Körperchen im strömenden Blute. Biochem. Z. 100: 188-190 (1919). 35 references.
- FUCHS, HANS J., and v. FALKENHAUSEN, M. FRHR. Ueber proteolytische Fermente im Serum. VII. Die Bedeutung des Komplements bei der Blutgerinnung. Biochem. Z. 184: 172-181 (1927). 43 footnotes.
- GEIL, TORBEN. Om globulin og albumin i serum og urin specielt med henblik paa deres udsaltningsforhold. Thesis, Copenhagen, 1928. 159 p. Bibl., p. 153-159.
- GLASER, F. Vegetatives Nervensystem und Blutzusammensetzung. Folia Hematol. 35: 366-368 (1927). 89 references.
- GRADWOHL, R. B. A., and I. E. Blood and urine chemistry. St. Louis, Mosby, 1928. 542 p. Numerous bibl. references.
- GUILLAUMIN, CH. O. Constitutions expérimentales sur la mesure du calcium sanguin après séparation oxalique. Sa répartition entre des globules, et le plasma ou le sérum. Bull. soc. chim. biol. 12: 1296-1297 (1930). 51 references.
- HENDERSON, L. J. Blood. A study in general physiology. New Haven, Yale Univ. Press, 1928. 397 p. Bibl. footnotes.
- HITTMAIR, ANTON. Die Blutplättchen. Folia Hematol. 35: 186-198 (1927). 1000 references.
- HOFF, FERDINAND. Ueber den Einfluss von Bakterienstoffen auf das Blut. Z. ges. exptl. Med. 67: 664-665 (1929). 63 references.
- HUECK, HERMANN. Zur Untersuchung der Eiweisskörper des Blutes. Biochem. Z. 159: 105-106; 160: 197-198 (1925). 115 references.
- KEESE, HERMANN. Die Schwankungsbreite der durch verschiedene chemisch-physikalische Untersuchungsmethoden erfassbaren Eigenschaften des Blutes des Pferdes unter physiologischen und pathologischen Bedingungen. Biochem. Z. 178: 206-207 (1926). 50 references.
- KURKOWSKY, W. P. Ueber Gehalt und Ausscheidung der Milchsäure im Blut nach leichte Muskelanstrengung. Z. ges. exptl. Med. 66: 204-205 (1929). 30 references.
- LANDAU, A., GLASS, J., and KAMINER, ST. Untersuchungen über den Chlorspiegel und die Chlorverteilung im Blut. Wiener Archiv innere Medizin 20: 426-428 (1930). 67 references.
- LAVES, OLAF. Ueber Konservierung in vitro und elektive Giftempfindlichkeit roter Blutkörperchen. Biochem. Z. 161: 444-445 (1925). 51 footnotes.
- MANN, F. C., and WILHELMJ, C. M. Physiology of the blood (American studies during 1927). Folia Hematol. 37: 120-122 (1928). 47 references.
- PARNAS, J. K., and HELLER, J. Ueber den Ammoniakgehalt und über die Ammoniakbildung im Blute. Biochem. Z. 152: 4 (1924). 26 references.
- Pneumonia, blood in. Index-Cat., S. G. O., 3rd ser., 8: 1036-1037 (1929).
- PRĄWDICZ-NEMINSKI, W. W. Ueber die periodischen Veränderung im Organismus. I. Die physiologischen Schwankungen der Katalase im Blute des Menschen. Biochem. Z. 192: 163-164 (1928). 31 references.
- PRĄWDICZ-NEMINSKI, W. W. Ueber die Reaktion des Blutes zur Geschlechtsbestimmung. Die Bedeutung der Mangammischung im Chemismus einer Reaktion der Geschlechtsbestimmung. Biochem. Z. 192: 322-323 (1928). 50 references.
- Pregnancy, blood in. Index-Cat., S. G. O., 3rd ser., 8: 1129-1130 (1929).
- RICHARDS, D. W., JR., and STRAUSS, M. L. Carbon dioxide and oxygen tensions of the mixed venous blood of men at rest. J. Clinical Investigation 9: 530-532 (1930). 38 references.
- Rickets, blood in. Index-Cat., S. G. O., 3rd ser., 9: 223 (1931). 26 references.
- RIGLER, RUDOLF. Die Pharmakologie der Gefässe und des Kreislaufes. In Handbuch normalen und pathologischen Physiologie 7, pt. 2: 998-1070 (1927). Bibl. footnotes.

- SCHILLING, VIKTOR. The blood picture and its clinical significance (including tropical diseases). St. Louis, Mosby, 1929. 408 p. Bibl., p. 369-379.
- SCHRATZ, EDUARD. Die "Manoiloff-Reaktion." Ihre chemische und physiologische Begründung. Ergebnisse Biol. 3: 262-264 (1928).
- SCHREIBER, HANS. Ueber den Rhodan-gehalt im menschlichen Blutserum. Biochem. Z. 163: 251 (1925). 27 references.
- SNAPPER, I. Chemie des Blutes. In Jahresber. Physiol. exptl. Pharmacol. 1: 197-206 (1920); 3: 192-202 (1922); 5: 296-307 (1924); 7: 557-567 (1926); 9: 529-547 (1928). Bibl. footnotes.
- SOKOLOVITCH, MILAN. Distribution of the phosphorus compounds and calcium in the blood of children. Arch. Diseases Childhood 6: 201, 208 (1931). 53 references.
- STRAUB, H., and MEIER, KLOTHILDE. Die Alkalireserve der Nierenkranken. Biochem. Z. 124: 258-297 (1921). 48 footnotes.
- Syphilis, blood in. Index-Cat., S. G. O., 3rd ser., 10: 10-11, 16 (1932).
- TESCHENDORF, WERNER. Ueber die Gefäßwirkung organischer Kationen und ihre Beeinflussung durch anorganische Ionen. Biochem. Z. 118: 284-285 (1921). 28 references.
- TOMASSON, HELGI. Chemische Veränderungen im Blut durch Narkose. Ruft die Aethernarkose eine Alkalose hervor. Biochem. Z. 170: 336 (1926). 21 references.
- Tuberculosis, blood in. Index-Cat., S. G. O., 3rd ser., 10: 502-504, 543-545 (1932).
- WELLS, H. G. Disturbances of circulation and diseases of the blood. In his Chemical Pathology, 5th ed., 323-362 (1925). 313 footnotes.
- See also GLYCOLYSIS.
- BLOOD: Analysis.**
- ANDERSEN, CHRISTIAN L. Blodsukkerbestemmelser hos patienter med senil corticalcataract. Thesis, Copenhagen, 1928. 178 p. Bibl., p. 174-178.
- BERNDT, ERHARD. Chemisch-physikalische Blutuntersuchungen. Berlin, Springer, 1929. p. 653-740. Bibl., p. 735-740.
- BUFANO, MICHELE. La fisiopatologia clinica e sperimentale della lipemia. Milano, Soc. an. Istituto editoriale scientifico, 1929. 294 p. Bibl. at end of each chapter.
- CUNY, L., and ROBERT, J. Sur le microdosage iodométrique de l'urée sanguine. I. Emploi de l'oxydation sulfo-iodique. Bull. soc. chim. biol. 12: 193-195 (1930). 34 references.
- KAUFMANN, E. Interferometrische Bestimmung des Blutfibrinogens. Z. ges. exptl. Med. 62: 183 (1928). 35 references.
- KILDUFFE, ROBERT A. The clinical interpretation of blood examinations. Philadelphia, Lea and Febiger, 1931. 629 p. Bibl. footnotes.
- LA MOTTE CHEMICAL PRODUCTS COMPANY. La Motte blood chemistry handbook. Baltimore, Md., La Motte Chemical Products Co., 1929. 77 p. Bibl., p. 21-22, 49.
- LUBLIN, ALFRED. Eine Mikromethode zur quantitativen Bestimmung des Acetons und β -Oxybuttersäure im Harn und Blute. Biochem. Z. 133: 641 (1922). 32 references.
- LUY, PAUL. Chemische und physikochemische Untersuchungen des Blutes und Serums normaler und an infektiöser Anämie erkrankter Pferde. Hannover, Schaper, 1930. 108 p. Bibl., p. 104-108.
- NAEGLIE, OTTO. Blutkrankheiten und Blutdiagnostik. 5. Aufl. Berlin, Springer, 1931. 704 p. Contains bibl.
- RICHTER-QUITTNER, MARIANNE. Zur Methodik der chemischen Blutanalyse. Biochem. Z. 158: 190-192 (1925). 74 references.
- RONA, P., and KLEINMANN, H. Untersuchung des Blutes. In Rona, Praktikum der physiologischen Chemie 2: 1-293 (1929). Bibl. footnotes.
- BLOOD CHOLESTEROL**
- GARDNER, J. A., and GAINSBOROUGH, HUGH. Blood cholesterol studies in biliary and hepatic disease. Quart. J. Med. 23: 479-480 (1930). 71 references.
- MANCKE, RUDOLF. Der Cholesteringehalt des Blutserums bei Leberkrankheiten. Deut. Archiv klin. Med. 170: 367-368 (1931). 39 references.
- MAXWELL, JAMES. The blood cholesterol in nephritis. Quart. J. Med. 21: 323-324 (1928). 41 references.
- See also CHOLESTEROL.
- BLOOD COAGULATION**
- FUCHS, HANS J. Die Rolle des Prothrombins bei der Blutgerinnung, der Muskelaktion und der Infektionsabwehr. Ergebnisse inneren Medizin u. Kinderheilkunde 38: 173-190 (1930).
- FUCHS, H. J., v. FALKENHAUSEN, M., and HARTMANN, E. Ueber die Beteiligung des Komplements bei der Blutgerinnung. Z. ges. exptl. Med. 64: 236-238 (1929). 56 references.

BLOOD COAGULATION—Cont'd

HEKMA, E. Die Fibringerinnung als Micellarkristallisations- und Agglutinationsprozess. *Biochem. Z.* 199: 332-365 (1928). 80 footnotes.

EHRICH, WILHELM. Einfluss der Plasmaeiweisskörper auf die Gerinnungszeit. *Biochem. Z.* 170: 376 (1926). 57 references.

TIETZE, ULRICH. Untersuchungen über die Gerinnungszeit des Blutes von Schafen und Rindern. *Landw. Jahrb.* 63: 805-806 (1928). 60 references.

WÖHLISCH, EDGAR. Die Physiologie und Pathologie der Blutgerinnung. *Ergebnisse Physiol.* 28: 443-455 (1929). 902 references.

BLOOD LIPOIDS *

THEORELL, HUGO. Studien über die Plasmalipide des Blutes. *Biochem. Z.* 223: 97-99 (1930). 103 references.

BLOOD PIGMENTS

FISCHER, HANS, and TREIBS, A. Farbstoffe mit Pyrrolkernen. In Oppenheimer, *Handb. Biochem.*, 2. Aufl., Ergänzungsband, 72-116 (1930). 159 footnotes.

HEILMEYER, LUDWIG. Blutfarbstoffwechselstudien. *Deut. Archiv klin. Med.* 171: 152-153 (1931). 68 references.

See also HEMOGLOBIN.

BLOOD PROTEINS

BERGER, W., and PETSCHACHER, L. Die Eiweisskörper im Blutplasma. I. Gesichtliches. II. Untersuchungsmethoden. III. Die Chemie der Plasmaeiweisskörper. *Folia Hematol.* 40: 159-164, 299-304, 359-369 (1930). Several hundred references.

BLOOD SUGAR

BARRENSCHEEN, H. K., *et al.* Beiträge zum Problems des Blutzucker. *Biochem. Z.* 177: 27-88 (1926). Bibl. footnotes.

CONSTAM, GEORG. Ueber den Einfluss peroraler Einnahme von Glucose auf Blutzucker und Glucosese beim Gesunden. *Biochem. Z.* 143: 103-104 (1923). 93 references.

GREVENSTUK, A., JR. Ueber freien und "gebundenen" Zucker in Blut und Organen. *Ergebnisse Physiol.* 28: 1-8 (1929). 546 references.

HARDING, VICTOR JOHN, and DOWNS, C. E. Blood sugar and amino acid nitrogen in lactation in women, with a note on lipid and inorganic phosphorus. *J. Biol. Chem.* 84: 344 (1929). 36 references.

PEISER, FRITZ. Ueber die Beziehungen zwischen Blutzuckerspiegel und Zuckerausscheidung. *Z. klin. Med.* 111: 525-526 (1929).

POLLAK, LEO. Ueber den Einfluss von Aminosäuren und Fettsäuren auf die Blutzuckerregulation. *Biochem. Z.* 127: 135-136 (1922). 27 references.

RONA, P., and BLOCH, E. Bestimmung des Blutzuckers. In Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 4: 845-886 (1925). Bibl. footnotes.

SCHÄTTI, A. Ueber den Einfluss verschiedener Kohlenhydrate und Aminosäuren auf Blut- und Harnzucker des gesunden Organismus. *Biochem. Z.* 143: 220 (1923). 65 references.

SOISALO, PAULI. Ueber die Blutzuckerkurve des gesunden Menschen. *Acta Soc. Med. Fennicae "Duodecim"* 13B, no. 3, 1930. 121 p. Bibl., p. 111-115.

BODY TISSUES *

VON BUENGNER, MIA. Zusammensetzung des menschlichen Fettgewebe. *Z. ges. exptl. Med.* 67: 164-165 (1929). 60 references.

HEUBNER, WOLFGANG. Der Mineralbestand des Körpers. Berlin, Springer, 1931. 94 p. Bibl. footnotes.

BOILING POINTS. See VAPOR PRESSURE.

BORATES

D'ARCHIARDI, G. Borate. In Doelter, *Handb. Mineralchem.* 3, pt. 2: 400-435 (1926). Bibl. footnotes.

BANCROFT, WILDER D., and CUNNINGHAM, G. E. Iron oxide in borate beads. *J. Phys. Chem.* 34: 1-40 (1930). Bibl. footnotes.

BORIC ACID

BANCROFT, WILDER D., and DAVIS, HERBERT L. The boric acid problem. *J. Phys. Chem.* 34: 2479-2507 (1930). Bibl. footnotes.

NASINI, R. Sassolin (Borsäure). In Doelter, *Handb. Mineralchem.* 3, pt. 2: 375-400 (1926). Bibl. footnotes.

BOTANICAL CHEMISTRY

HARVEY, RODNEY B. Plant physiological chemistry. New York, Century, 1930. 413 p. Bibl., p. 373-397.

MAUME, L., and DULAC, J. Le problème de la toxicité et de l'antagonisme en physiologie végétale. *Ann. sci. agron.* 46: 441-443 (1929). 54 references.

ONSLow, MURIEL. The principles of plant biochemistry. Cambridge, Univ. Press, 1931 +. Bibl. at end of chapters.

PANTANELLI, E. Ueber Ionenaufnahme. *Protoplasma* 7: 135-137 (1929). 50 references.

ROBINSON, MURIEL E. Cyanogenesis in plants. *Biol. Rev. Cambridge Phil. Soc.* 5: 140-141 (1930).

SHAW, F. J. F., and BOSE, R. D. List of publications on the botany of Indian crops. *Agr. Research Inst., Pusa, Bull.* 202. 1930. 256 p.

- STEWART, F. C. Diffusion of certain solutions through membranes of living plant cells and its bearing upon certain problems of solute movement in the plants. *Protoplasma* 11: 555-557 (1930). 38 references.
- WEHMER, C. Die Pflanzenstoffe. 2. Aufl. Jena, Fischer, 1929-1930. 1511 p. Bibls. through text.
- See also PLANTS: COMPOSITION, PLANTS: METABOLISM.
- BRASS**
- ST. JOHN, H. M. Influence of impurities in foundry brasses and bronzes. *Metals and Alloys* 2: 245 (1931). 31 references.
- See also COPPER, CORROSION.
- BREAD**
- PLATT, W. Staling of bread. *Cereal Chem.* 7: 33-34 (1930). 50 references.
- See also FLOUR.
- BREWING**
- BRITTON, H. T. S. Importance of hydrogen ion concentration in brewing. *Ind. Chemist* 4: 150-153, 162 (1928). Bibl. through text.
- FOTH, GEORG. Handbuch der Spiritusfabrikation. Berlin, Parey, 1929. 1139 p. Contains numerous references.
- SCHOELLHORN, FRITZ. Bibliographie des Brauwesens. Einsiedln, Benziger, 1928. 436 p.
- See also FERMENTATION.
- BRICK**
- COLE, SANFORD S. Thermal expansion of silica brick and mortars. *J. Am. Ceram. Soc.* 13: 445-446 (1930). 56 references.
- BRONZE**
- CARSON, ORRIN ARTHUR. The bronzes. Thesis, Columbia Univ., 1929. 141 p. Bibl., p. 7-9. *Can. Mining Met. Bull.*, Jan., 1929.
- CLAUS, W. Sonder-Bronzen. *Metallbörse* 20: 1769-1770, 1825-1826, 1881-1882, 1937-1938, 1993-1994, 2049-2050, 2105-2106, 2161-2162, 2217-2218, 2274-2276, 2331-2332, 2386-2387 (1930). 35 footnotes.
- DANIELS, EDW. J. Unsoundness in bronze castings. *J. Iron Steel Inst.* 43: 142 (1930). 30 references.
- BUILDING MATERIALS***
- RABALD, ERICH. Werkstoffe. Physikalische Eigenschaften und Korrosion. 2 vol. Leipzig, Spamer, 1930. 10,000 references.
- BUILDING STONE**
- KAISER, ERICH. Ueber eine Grundfrage der natürlichen Verwitterung und die chemische Verwitterung der Bausteine im Vergleich mit der in der freien Natur. *Chemie der Erde* 4: 340-342 (1929). 30 references.
- KESSLER, D. W. Bibliography on weathering of natural stone. *Proc. Am. Soc. Testing Materials* 31, pt. II: 804-813 (1931). 100 references; covers 1851 to 1931.
- BUTTER**
- KING, NICOLAUS. Kolloidchemie der Butter. *Kolloid-Z.* 52: 319-332 (1930). 109 footnotes.
- MACY, HAROLD. Some of the factors influencing the growth of molds in butter. *Minn. Agr. Expt. Sta., Tech. Bull.* 64. 1929. 86 p. Bibl., p. 77-86. 148 references.
- MACY, H., and PULKRABEK, G. M. Parchment paper as a source of mold infection in butter. *Minn. Agr. Expt. Sta., Bull.* 242: 20-23 (1928).
- RAHN, O., and WEIGMANN, H. Die Rahmgewinnung und die Butterbereitung. In Winkler, Handb. Milchwirtschaft 2, pt. 2: 135-139 (1931).
- BUTTERMILK***
- PETERSEN, W. E., and HERREID, E. O. New method for estimating the true fat content of buttermilk. *Minn. Agr. Expt. Sta., Tech. Bull.* 63. 1929. 16 p. Bibl., p. 14-16. 22 references.
- BUTYL ALCOHOL.** See FERMENTATION (Neuberg, Smyth, Ullrich).
- CACAO**
- VAN HALL, C. J. J. Review of the more important recent literature on cacao. *Monthly Bull. Agr. Sci. Practice* 22: 132 (1930).
- CADMIUM**
- IMPERIAL INSTITUTE. Mineral industry of the British Empire and foreign countries. Cadmium. London, The Institute, 1929. 23 p. Bibl., p. 19-23.
- CALCIFICATION**
- WELLS, H. G. Calcification, concretion and incrustations. In his *Chemical Pathology*, 5th ed., 486-525 (1925). 238 footnotes.
- CALCIUM**
- PRENANT, MARCEL. Les formes minéralogiques du calcaire chez les êtres vivant, et de problème de leur déterminisme. *Biol. Rev. Cambridge Phil. Soc.* 2: 390-393 (1927).
- CALCIUM: Biochemistry***
- CANTAROW, ABRAHAM. Calcium metabolism and calcium therapy. Philadelphia, Lea and Febiger, 1931. 215 p. Bibl., p. 185-200.
- CORLETTE, C. E. Observations on the calcium deficiency as a cause of certain diseases of animals and man. *Med.*

CALCIUM: Biochemistry *—Cont'd

J. Aust. 1: 198-215 (1928); Vet. J. 84: 231-244, 295-304, 452-456, 507-514, 570-574 (1928). 58 references.

HERZFELD, ERNST, *et al.* Die klinische Bedeutung des Serumkalkspiegels beim Menschen (Kritische Uebersicht, 1923-1928). Folia Hematol. 41: 142-165 (1930).

KLEINMANN, HANS. Die Zustandsform des Calciums in Geweben und Gewebssäften. Biochem. Z. 196: 143-145 (1928). 90 references.

McCLURE, F. J., and MITCHELL, H. H. The effect of fluorine on the calcium metabolism of albino rats and the composition of the bones. J. Biol. Chem. 90: 319-320 (1931). 37 references.

SOROKIN, HELEN, and SOMMER, ANNA L. Changes in the cells and tissues of root tips induced by the absence of calcium. Am. J. Botany 16: 37 (1929). 25 references.

See also BIOCHEMISTRY (Peters and Van Slyke).

CALCIUM ALUMINATES *

TRAVERS, A., and SEHNOUTKA, J. Étude sur les aluminates de calcium hydrates. Ann. chim. 10: 265-266, 313, 333 (1930). 49 references.

CALCIUM CARBIDE

DANNEEL, —. Calciumcarbid. In Ullmann, Enzyk. tech. Chem., 2nd ed., 2: 749-785 (1928). References through text.

TAUSSIG, RUDOLF. Die Industrie des Kalziumkarbides. Halle, Knapp, 1930. 518 p. Bibl. footnotes. German patents, p. 498-505. Bibl., p. 506-508.

CALCIUM CARBONATE

KRAUSS, F., and SCHRIEVER, W. Die Hydrate des Calciumcarbonats. Z. anorg. allgem. Chem. 188: 259-273 (1930). 37 footnotes.

CALCIUM CYANAMIDE

FRANCK, H. H., MAKKUS, W., and JANKE, F. Der Kalkstickstoff in Wissenschaft, Technik und Wirtschaft. Sammlung chem., chem.-tech. Vorträge, N. F., No. 6. 1931. 231 p. Bibl., p. 211-213. 67 references.

KAHN, R. Rationelle Kalkstickstoff-Fabrikation. Metallbörse 18: 1295-1296, 1406-1408, 1463-1465 (1928). Patents through text.

KRAUSS, C., POHLAND, R., and ULLMANN, F. Calciumcyanamid. In Ullmann, Enzyk. tech. Chem., 2nd ed., 3: 1-37 (1929). References through text.

CALCIUM FLUORIDE

DOELTER, C. Fluorit. In *his* Handb. Mineralchem. 4, pt. 3: 193-269 (1930). Bibl. footnotes.

CALCIUM SULFATE

DOELTER, C. Calciumsulfat. In Doelter, Handb. Mineralchem. 4, pt. 2: 115-156, 187-204 (1929). Bibl. footnotes. Includes gypsum.

CAMPHOR

DUBOSC, A. Vorkommen, Gewinnung und Synthese des Camphers. Metallbörse 21: 1037, 1132, 1228-1229, 1324-1325 (1931). Patent review.

PFANKUCH, E. Campher (Pharmakologie). In Houben. Fortschritte der Heilstoffchemie, Zweite Abteilung, Bd. 1: 1343-1379 (1930). Bibl. footnotes.

ULLRICH, A. Der synthetische Campher. Metallbörse 18: 1013-1014, 1069-1070 (1928); Ind. Chimica 4: 384-389 (1929). Patents through text.

CANCER

BELL, W. B. Some aspects of the cancer problem. London, Baillière, 1930. 543 p. Bibl., p. 515-534.

GUERIN, M. L'influence de l'alimentation dans le cancer. Neoplasmes 8: 34-41 (1929). 117 references.

JACKSON, HENRY, JR. Certain biological aspects of cancer. Medicine 7: 378-382 (1928). 212 references.

JACKSON, HENRY, JR. Recent advances in the biology of cancer. New England J. Med. 201: 303 (1929). 131 references.

WATERMAN, N. Physikalisch-chemische Untersuchungen über das Karzinom. Biochem. Z. 133: 596-597 (1922). 49 references.

See also TUMORS.

CANNABIS *

See PHARMACEUTICALS (Munch).

CANNING AND PRESERVING

CAMPBELL, CLYDE H. Campbell's book; a text book on canning, preserving and pickling. New York, Canning Age, 1929. 246 p. Bibl., p. 217-229.

MALCOLM, OLA POWELL. Successful canning and preserving. 4th ed. Philadelphia, Lippincott, 1930. 663 p. Bibl., p. 623-644.

CAPILLARITY

AUERBACH, FELIX. Kapillarität. In Auerbach and Hort, Handb. physik. tech. Mechanik 7: 1-168 (1928). Bibl. footnotes.

FREUNDLICH, HERBERT. Kapillarchemie. In Auerbach and Hort, Handb. physik. tech. Mechanik 7: 169-197 (1928). Bibl. footnotes. Bibl., p. 195-197.

FREUNDLICH, HERBERT. Kapillarchemie. Bd. I. Leipzig, Akad. Verlagsges., 1930. 566 p. Bibl. footnotes.

SMITH, CARLETON N. Adhesion tension values of different types of carbon black against water and benzene. Thesis, Univ. of Michigan, 1929. 15 p. Bibl., p. 14-15.

CAPSICUM. See DRUGS: ANALYSIS, PHARMACEUTICALS.

CARBAZOLE. See ANTHRACENE.

CARBIDES

DANNEEL, H. Carbid. In Ullmann, Enzyk. tech. Chem., 2nd ed., 3: 90-107 (1929). References through text.

HOYT, S. L. Hard metal carbides and cemented tungsten carbides. Am. Inst. Mining Met. Eng., Inst. Metals Div., Trans., 1930: 9-58. 48 footnotes.

CARBOHYDRASE *

WAGNER-JAUREGG, THEODOR. Substrate der Carbohydrasen: Darstellung und Eigenschaften. In Oppenheimer, Fermente, 3: 244-273 (1929). 191 references.

CARBOHYDRATES

BERTRAND, GABRIEL. Résumé historique de la chimie des oses, particulièrement depuis Emil Fischer. In Rapports sur les hydrates de carbone, p. 31-32. (Dixième conférence de l'union internationale de chimie, Paris, 1930). Bull. soc. chim. 49: 649-650 (1931). 66 references.

CATELAIN, E. Du formol au saccharose; la synthèse du hexobiose. J. pharm. chim. 9: 161-162 (1929). 30 references.

COLES, HAROLD W. The literature of alkylated carbohydrates. I. Triose, tetrose and pentose derivatives. II. Galactose derivatives. III. Alkylated mannose derivatives. IV. Fructose derivatives. Iowa State Coll. J. Sci. 5: 61-69, 71-75, 77-83, 243-250 (1931).

EVANS, WILLIAM LLOYD. The mechanism of carbohydrate oxidation. Chem. Reviews 6: 314-315 (1929). 54 references.

HARRISON, F. C., TARR, H. L. A., and HIBBERT, HAROLD. The synthesis of polysaccharides by bacteria and enzymes. Can. J. Research 3: 462-463 (1930). 40 references.

HAWORTH, W. N. Ring structure in the mono-, di- and poly-saccharides (holosides). In Rapports sur les hydrates de carbone, p. 57-58. 62 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

HUDSON, C. S. Correlation of optical rotatory power and structure in the sugar group. In Rapports sur les hydrates de carbone, p. 77-78. 53 references.

(Dixième conférence de l'union internationale de chimie, Paris, 1930).

KARRER, P. Ueber Strukturfragen bei Polysacchariden. In Rapports sur les hydrates de carbone, p. 153. 46 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

LOHMANN, K. Die Zuckerphosphorsäureester und ihre Bedeutung für den Stoffwechsel der Hefe und des Muskels. In Oppenheimer, Handb. Biochem., 2. Aufl., Ergänzungsband, 133-161 (1930). 97 footnotes.

LÜDTKE, MAX, and NEUBERG, CARL. Alloiomorphe Zucker (am-Zucker). In Oppenheimer, Handb. Biochem., 2. Aufl., Ergänzungsband, 117-132 (1930). 115 footnotes.

MARK, H. Die Verwendung der Röntgenstrahlen beim Studium der Polysaccharide und ihrer Derivative. In Rapports sur les hydrates de carbone, p. 189-191. 75 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

MEYER, K. H., and MARK, H. Der Aufbau der hochpolymeren organischen Naturstoffe. Leipzig, Akad. Verlagsges., 1930. 264 p. Bibl., p. 244-253. 346 references.

NEUBERG, CARL, and LÜDTKE, MAX. Kohlenhydrate. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, 1: 10-82 (1929). Sugars, p. 28-30; 156 references; nitrogen-free extracts, p. 42-43; 83 references; substances of the plant cell membranes, p. 70-72; 257 references; fermentation of carbohydrates, p. 81-82; 85 references.

OHLE, H. Die Chemie der Monosaccharide und der Glykolyse. Ergebnisse Physiol. 33: 558-701 (1931). Bibl. footnotes.

PICET, A., and VOGEL, H. Die Zuckeranhydride und ihre Verwendung zur Synthese von Disacchariden. Fort. Chem., Physik, physik. Chem. 20, No. 4, 1929. 56 p. Bibl. footnotes.

PRINGSHEIM, HANS. Das Molekulargewicht der komplexen Polysaccharide. In Rapports sur les hydrates de carbone, p. 173-174. 55 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

PRINGSHEIM, HANS. Die Polysaccharide. 3. Aufl. Berlin, Springer, 1931. 393 p. Numerous bibl. footnotes.

PRINGSHEIM, HANS, and STEINGROEVER, ARNOLD. Kohlenhydrate. In Houben, Meth. org. Chem., 3. Aufl., 3: 228-265 (1930). Bibl. footnotes.

CARBOHYDRATES—Cont'd

SHAFFER, PHILIP A., and FRIEDEMANN, THEODORE E. Sugar activation by alkali. I. Formation of lactic and saccharinic acids. *J. Biol. Chem.* 86: 372-374 (1930). 45 references.

SHORLGIN, P. P. Summary of the principal work on the chemistry of carbohydrates. *Zhur. Sacc. Prom.* 4: 413-437 (1930). 97 references.

SOCIETY OF CHEMICAL INDUSTRY. Sugars, starches and gums. *In* Reports on the progress of applied chemistry 14: 490-510 (1929); 115 footnotes; 15: 560-581 (1930); 131 footnotes.

SPOEHR, H. A., and STRAIN, HAROLD H. The effect of weak alkalis on the trioses and on methylglyoxal. *J. Biol. Chem.* 89: 524-525 (1930). 39 references.

SPOEHR, H. A., and STRAIN, HAROLD H. The interconversion of hexoses by means of phosphates and the formation of glucose. *J. Biol. Chem.* 85: 383-384 (1929). 40 references.

SUGAR. Index-Cat., S. G. O., 3rd ser., 9: 1092-1097 (1931).

THAYSEN, A. C., and GALLOWAY, L. D. The microbiology of starch and sugars. London, Oxford Univ. Press, 1930. 326 p. Bibls. at end of chapters.

VOGEL, H., and GEORG, A. Tabellen der Zucker und ihrer Derivate. Berlin, Springer, 1931. 663 p. Bibl. in last column of rectos: p. 3-631.

ZEMPLÉN, GÉZA. Die einfachen Zuckerarten. *In* Abderhalden, *Biochem. Handl.* 13: 250-783 (1931). Numerous bibl. footnotes.

ZEMPLÉN, GÉZA. Kohlenhydrate. *In* Abderhalden, *Biochem. Handl.* 13: 1-11 (1931). Bibl. footnotes.

ZEMPLÉN, GÉZA. Stickstoffhaltige Kohlenhydrate. *In* Abderhalden, *Biochem. Handl.* 13: 818-848 (1931). Bibl. footnotes.

See also SUGAR, Names of individual carbohydrates, *c. g.*, GALACTOSE, GLUCOSE, LACTOSE, etc.

CARBOHYDRATES: Analytical.

DISCHE, Z. Kohlenhydrate. *Mikrochemie* 10: 129-187 (1931). 123 footnotes.

SCHMIDT, ERICH, ATTERER, MATTHIAS, and SCHUEGG, HANS. Quantitative Bestimmung von Hexosen in Hydrolysaten von Polysacchariden. *Cellulosechemie* 12: 235-242 (1931). 53 footnotes.

CARBOHYDRATES: Metabolism.

AUBEL, E., and CAIN, TH. Rôle du phosphore dans le métabolisme des glucides dans le muscle. *Bull. soc. chim. biol.* 11: 927-928 (1929). 36 references.

COLLAZO, J. A., and BAYO, C. P.-S. Ueber die Wirkung des B-Vitamins und des Insulins auf die Kohlenhydrat-Stoffwechselstörungen bei Mangel an B-Vitaminen. *Biochem. Z.* 238: 348-350 (1931). 93 references.

CORT, CARL F. Mammalian carbohydrate metabolism. *Physiol. Rev.* 11: 252-275 (1931). 456 references.

DIERYCK, JOSEPH. La traversée comparée des monosaccharides en pathologie hépatique. *Nutrition* 1: 348-358 (1931). 185 references.

FIESSINGER, N., and DIERYCK, J. L'épreuve sucrée amphogyre. *Ann. méd.* 29: 153-155 (1931). 52 references.

SEUFFERT, R. W. Die Kohlenhydrate im Stoffwechsel. *In* Mangold, *Handbuch der Ernährung und des Stoffwechsels des landwirtschaftlichen Nutztiers* 3: 115-121, 142-144 (1931). 677 references.

STRANSKY, EMIL. Ueber den Einfluss von Mineralstoffen auf den Zuckerstoffwechsel. *Biochem. Z.* 221: 100 (1930). 47 references.

TOENNIESSEN, E., and BRINKMANN, E. Ueber den oxydativen Abbau der Kohlenhydrate im Säugetiermuskel. *Z. physiol. Chem.* 187: 137-159 (1930). 80 footnotes.

TSUBURA, SHIRO. Beiträge zur Kenntnis der inneren Sekretion der Keimdrüsen. I. Keimdrüsen und Kohlenhydratstoffwechsel. *Biochem. Z.* 143: 248-290 (1923). 83 footnotes.

WIERZUCHOWSKI, M. Respiratorischer Gaswechsel der Glykose, Fructose und Galaktose bei ihrer intravenösen Injektion. *Biochem. Z.* 230: 223-224 (1931). 56 references.

WIERZUCHOWSKI, M., *et al.* Zuckerasimilation, Phosphor- und Wasserstoffwechsel bei intravenöser Dauerinjektion der Glykose, Fructose und Galaktose. *Biochem. Z.* 230: 171-172 (1931). 53 references.

See also BIOCHEMISTRY (Peters and Van Slyke).

CARBOHYDRATES: Pharmacology.*

STAUB, HANS. Zucker (Pharmakologie). *In* Houben, *Fortschritte der Heilstoffchemie, Zweite Abt.*, Bd. I: 583-680 (1930). Bibl. footnotes.

CARBOLIGASE *

HIRSCH, JULIUS. Zur Kenntnis der Carboligase. *Biochem. Z.* 131: 178-187 (1922). 27 footnotes.

CARBON

OSWALD, M. Existence de deux variétés de carbone amorphe. *Chimie et industrie* 24: 292 (1930). 30 references.

OSWALD, M. Structure du carbone de pyrogenation compact. *Chimie et industrie*, Special No.: 266 (Mar., 1931). 30 references.

SANDER, A. Fortschritte der Kohlenforschung und Kohlentechnik in den Jahren 1923 bis 1929. *Fortschrittsber. Chem.-Ztg.* 1930: 41-73. 648 footnotes.

SINGER, LEOPOLD. Anorganische und organische Entfärbungsmittel. Dresden, Steinkopff, 1929. 259 p. Patents, classified by countries, p. 210-231. Bibl. footnotes.

ZELLNER, —, and KUCH, —. Elektrische Kohlen. In Ullmann, Enzyk. tech. Chem., 2. Aufl., 4: 372-386 (1929). Bibl., p. 386. Patent references through text.

See also ELECTRODES.

CARBON: Activated.

BARKER, M. E. The mechanism of charcoal activation. *Ind. Eng. Chem.* 22: 930-931 (1930); *Chem. Warfare* 16: 823-825 (1930). 47 references. Classified. Author has a bibl. of 200 titles, sent on request.

FIELDNER, A. C., HALL, R. E., and GALLOWAY, A. E. Study of the production of activated carbon from various coals and other raw materials. U. S. Bur. Mines, Tech. Paper 479. 1930. 30 p. Bibl., p. 28-30. 49 references.

KRCZIL, F. Neuere Fortschritte auf dem Gebiete der Herstellung und Wiederbelebung von aktiver Kohle. *Kolloid-Z.* 55: 367-371; 56: 111-116 (1931). Patent review.

NAGANOV, N. Recent literature on activated carbon. *Naukovi Zapiski* 5: 359-366 (1928).

ROYCHOUDHURY, S., and MUKHERJEE, I. N. Hydrolytische Adsorption durch aktivierte Kohle. *Kolloid-Z.* 57: 307 (1931). 33 references.

See also CATALYSIS (Druckner).

CARBON DIOXIDE

AUERBACH, E. B. Kohlensäure. In Ullmann, Enzyk. tech. Chem., 2. Aufl., 6: 588-604 (1930). Patents, p. 601.

CARBON DIOXIDE: Biochemistry. See BIOCHEMISTRY (Peters and Van Slyke).

CARBON DISULFIDE

KOBE, K. A. The sulfide of carbon. *J. Chem. Education* 8: 874 (1931). 32 references.

MUHLERT, FRANZ. Der Kohlenschwefel. Halle, Knapp, 1930. 139 p. Bibl. footnotes.

See also GASES: FUEL.

CARBON MONOXIDE

KEESER, E., et al. Toxikologie und Hygiene des Kraftfahrwesens (Auspuffgase und Benzine). Berlin, Springer, 1930. 106 p. 240 references on toxicology and hygienic problems of exhaust gases and particularly the determination of small amounts of carbon monoxide in air.

SAYERS, R. R., and DAVENPORT, SARA J. Review of carbon monoxide poisoning. *Public Health Bull.* No. 195. 1930. 97 p. Bibl., p. 87-97. 195 references.

CARBON SUBOXIDE

REYERSON, L. L., and KOBE, KENNETH. Carbon suboxide. *Chem. Reviews* 7: 491-492 (1930). 31 references.

CARBON TETRACHLORIDE

WOLFF, J. W. Carbon tetrachloride. *Geneeskund. Tydschr. Nederland Indië* 67: 254-263 (1927).

CARBONYL GROUP

EICHWALD, EGON. Nachweis von Carbonylgruppen. In Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 4: 193-231 (1924). Bibl. footnotes.

CARBONYLS

MOND, ROBERT L. Les carbonyles métalliques. *Chimie et industrie* 21: 937-940 (1929); *J. Soc. Chem. Ind.* 49: 288-290 (1930). 91 references and 69 patents.

See also IRON: CHEMISTRY (Koppel).

CARBOXYL GROUP *

POSNER, THEODOR. Die Carboxylgruppe. In Houben, *Meth. org. Chem.*, 3. Aufl., 3: 826-960 (1930). Bibl. footnotes.

CARBOXYLASE

NEUBERG, CARL. Carboxylase. In Oppenheimer, *Fermente* 3: 1317-1328 (1929). 53 footnotes.

CARNALLITE

DOELTER, C. Carnallit. In his *Handb. Mineralchem.* 4, pt. 2: 1185-1209 (1928). Bibl. footnotes.

CAROTIN

JAVILLIER, M. Le carotène et la croissance des animaux. *Bull. soc. chim.* (4) 47: 505-508 (1930); *Bull. soc. chim. biol.* 12: 574-578 (1930). 68 references.

KARRER, PAUL. Carotinoide. In Oppenheimer, *Handb. Biochem.*, 2. Aufl., *Ergänzungsband*, 63-71 (1930). 36 footnotes.

KARRER, P. Ueber Carotinoidfarbstoffe. *Z. angew. Chem.* 42: 918-924 (1929). 40 footnotes.

See also LIPIDS, PIGMENTS, VITAMINS.

CASCARA

- STARKER, T. J., and WILCOX, A. R. Cascara. *Am. J. Pharm.* 103:175 (1931). 26 references.

CASEIN

- GASSER, E. Animal and vegetable casein: Preparation and uses. *Monthly Bull. Agr. Sci. Practice* 22:28-31 (1931). 42 references.

- LINDERSTRÖM-LANG, K. Fractionation of casein. *Compt. rend. trav. lab. Carlsberg* 17, no. 9, 1929, 116 p. *Bibl.*, p. 110-114. 113 references.

- VAN SLYKE, L. L. Summary of research studies relating to casein and some of the applications. *N. Y. State Agr. Expt. Sta., Tech. Bull.* 139:40-41 (1928). 27 references.

CATALASE

- HENNICH, SAMUEL. Zur Kenntnis der Katalase und ihrer Beziehung zu biologischen Oxydationen. *Biochem. Z.* 171:314-371 (1926). 80 footnotes.

- OVERHOLSER, E. L. Study of the catalase of the fruits of pear varieties. *Am. J. Bot.* 15:305-306 (1928). 26 references.

- SAMMARTINO, UBALDO. Ueber die Bedeutung des Milieus beim Studium der Katalase. *Biochem. Z.* 126:188 (1922). 38 references.

- STERN, L. Die Beziehung des Katalase-systems zu den Oxydationsvorgängen in den Tiergeweben. *Biochem. Z.* 182:154 (1927). 53 references.

See also OXIDASE (Woker).

CATALYSIS

- ARMSTRONG, E. F., and HILDITCH, T. P. Seventh report of the Committee on contact catalysis. *J. Phys. Chem.* 33:1454-1455 (1929). National Research Council, Reprint and Circular Series, No. 90. 1929. 15 p. About 75 references.

- BRÖNSTED, J. N. The theory of acid and basic catalysis. *Trans. Faraday Soc.* 24:630-640 (1928). 30 footnotes.

- BRUCKNER, HORST. Katalytische Reaktionen in der organisch-chemischen Industrie. Dresden, Steinkopff, 1930. 168 p. Several hundred footnotes; lists of patents on active charcoal, 26-27; silica gel, 30-31; multiple substance catalysts, 33-35; catalytic oxidation of toluene, 106.

- VON EULER, H. Biokatalysatoren. Sammlung chem. chem.-tech. Vorträge, N. F., Heft 4. 1930. 68 p. *Bibls.* through text.

- FEIGL, F. Katalyse und Mikrochemie. *Mikrochemie* 10:296-305 (1931). 36 footnotes.

- FRANKENBURGER, W., and DÜRR, F. Katalyse. Berlin, Urban und Schwarzenberg, 1930. 56 p. *Bibl.* footnotes.

- FRANKENBURGER, W., and DÜRR, F. Katalyse. *In* Ullmann, *Enzyk. tech. Chem.*, 2nd ed., 6:436-491 (1930). *Bibl.* footnotes; *bibl.*, p. 490-491; patent list, p. 440-454. Covers industrial applications.

- FRASER, J. C. W. Eighth report of the Committee on contact catalysis. *J. Phys. Chem.* 34:2129-2179 (1930). National Research Council, Reprint and Circ. Series, No. 94. 1930. 51 p. About 250 footnotes.

- GEDYE, G. R. Effect of water as a promoter of chemical reactions. *Science Progress* 24:261-262 (1929). 39 references.

- HINSHELWOOD, C. N. Homogeneous catalysis. *Trans. Faraday Soc.* 24:552-559 (1928). 39 footnotes.

- KAUSCH, O. Die Kontaktstoffe der katalytischen Herstellung von Schwefelsäure, Ammoniak und Salpetersäure. Halle, Knapp, 1931. 216 p. *Bibl.*, p. 192-200. Patents on catalysts for sulfuric acid, p. 161-170; on purification of roasting gases, p. 171-172; ammonia, p. 172-185; nitric acid, p. 185-190.

- KONDAKOV, I. L. Autocatalysis. *Chem. Listy* 24:271-277, 293-297 (1930).

- KRAMER, WARREN A. The catalytic oxidation of carbon. Thesis, Ohio State Univ., 1927. 40 p. *Bibl.*, p. 38-39.

- MITCHELL, J. A. Organic catalytic reactions. *J. Chem. Education* 9:69-71 (1930). 75 references.

- MITTASCH, A. Einiges über Mehrstoffkatalysatoren. *Z. Elektrochem.* 36:569-580 (1930). *Bibl.* footnotes.

- NATTA, G. Relazioni fra la attività di catalizzatori proposti per la sintesi dell'alcool metilico e la loro struttura chimica e cristallina. *Giorn. chim. ind. appl.* 12:13-23 (1930). 75 footnotes.

- PASCAL, PAUL. Synthèses et catalyses industrielles; fabrications minérales. 2. ed. Paris, Hermann, 1930. 456 p. Contains *bibls.*

- RIDEAL, E. K., and WANSBROUGH-JONES, O. H. Catalysis. *In* Annual reports on the progress of chemistry 25:323-359 (1928). 191 footnotes.

- SAUTER, ERWIN. Heterogene Katalyse. Dresden, Steinkopff, 1930. 80 p. *Bibl.* footnotes.

- SAUTER, ERWIN. Heterogene Katalyse und Sorption. *Z. Elektrochem.* 30:874-881 (1930). 58 footnotes.

- SAUTER, ERWIN. Katalyse und Sorption. *Kolloid-Z.* 49:450-458 (1929). 45 footnotes.

- SCHWAB, GEORG M. Katalyse vom Standpunkt der chemischen Kinetik. Berlin, Springer, 1931. 249 p. *Bibl.*, p. 235-243.

SCHWAB, G. M., and PIETSCH, E. Die Lokalisierung der Katalysatorwirkung vom Standpunkt des Experiments. *Z. Elektrochem.* 35: 581-582 (1929). 55 references.

SKRABAL, ANTON. Kinetics of acid and basic catalysis. *Trans. Faraday Soc.* 24: 687-696 (1928). 30 footnotes.

TAYLOR, HUGH S. Chemical reactions at surfaces. *Chem. Reviews* 9: 44-46 (1931). 85 references.

TAYLOR, HUGH S. Contact catalysis. In Alexander, *Colloid Chemistry* III: 118 (1931). 40 references.

WAESER, B. Vanadium compounds as catalysts in the sulfuric acid industry. *Metallbörse* 19: 1349-1350, 1406-1407 (1929). Patents.

WOKER, GERTRUD. Die Katalyse. Biologische Katalysatoren. Stuttgart, Enke, 1931. 592 p. Extensive bibl. footnotes.

See also PALLADIUM.

CATHARTICS.* See PHARMACEUTICALS (Munch).

CELLOBIOSE

ZEMPLÉN, GÉZA. Cellobiose. In Abderhalden, *Biochem. Handl.* 13: 559-566 (1931). Bibl. footnotes.

CELLS

GELLHORN, E. Die Zelle in ihrer Umwelt. Austausch der Nährstoffe und Zellstoffe. In Oppenheimer, *Handb. Biochem.*, 2nd ed., 2: 315-432 (1925). 432 footnotes.

METZNER, P. Zur Kenntnis der photodynamischen Erscheinung. III. Ueber die Bindung der wirksamen Farbstoffe in der Zelle. *Biochem. Z.* 148: 522-523 (1924). 30 references.

OPARIN, A. Zur Kenntnis der Oxydationsvorgänge in der lebenden Zelle. *Biochem. Z.* 182: 179 (1927). 26 references.

PARAT, MAURICE. Review of recent developments in histochemistry. *Biol. Rev. Cambridge Phil. Soc.* 2: 295-297 (1927). 46 references.

PEIFFER, HANS. Der isoelektrische Punkt von Zellen und Geweben. *Biol. Rev. Cambridge Phil. Soc.* 4: 31-40 (1929). 298 references.

PINCUSSEN, LUDWIG. Der Einfluss der Strahlung auf der Zelle. In Oppenheimer, *Handb. Biochem.*, 2nd ed., 2: 739-770 (1925). 191 footnotes.

REISS, P. Le pH intérieur cellulaire. Paris, Presse Univ. de France, 1926. 135 p. Bibl., p. 126-132.

REMINGTON, ROE E. The high frequency Wheatstone bridge as a tool in cytological studies; with some observations on the resistance and capacity

of the cells of the beet root. *Protoplasma* 5: 390-399 (1929).

RESNITSCHENKO, M. S. Weitere Beiträge zur Cyanidwirkung auf die lebende Zelle. *Biochem. Z.* 201: 124 (1928). 32 references.

SCHAEDE, REINHOLD. Die Kolloidchemie des pflanzlichen Zellkernes in der Ruhe und in der Teilung. *Ergebnisse Biol.* 5: 26-28 (1929).

WELLS, H. G. Chemistry and physics of the cell. In *his Chemical Pathology*, 5th ed., 1-36 (1925). 60 footnotes.

CELLULOSE

DUCLAUX, JACQUES. État colloidal de la cellulose et de ses dérivés. In *Rapports sur les hydrates de carbone*, p. 235-237. 108 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

GRAY, H. LE B. The constitution and properties of cellulose. *J. Chem. Education* 7: 1810-1811 (1930). 38 references.

HERZOG, R. O., HOFFMANN, H., and KRATKY, O. Fortschritte auf dem Gebiete der hochmolekularen Verbindungen. In Oppenheimer, *Handb. Biochem.*, 2. Aufl., Ergänzungsband, 1-62 (1930). 140 footnotes.

HESS, KURT, *et al.* Morphologie und Chemismus bei Cellulose-Faser. *Ber.* 64B: 408-427 (1931). 68 footnotes.

HEUSER, EMIL. The relation between cellulose properties and its industrial applications. In *Rapports sur les hydrates de carbone*, p. 213. 31 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

HEUSER, EMIL, and HIEMER, NORBERT. Ueber die Depolymerisation der Cellulose. *Cellulosechemie* 6: 101-122, 125-132, 153-166 (1925). 83 footnotes.

KATZ, J. R. Das Problem der Quellung des Cellulose und ihrer Derivative. *Cellulosechemie* 11: 17-30 (1930). 48 footnotes.

KRÜGER, D. Neuere Ergebnisse der Cellulosechemie. *Zellstoff u. Papier* 11: 333-337 (1931). 67 footnotes.

KRÜGER, D. Zellstoff in der Kunstseidenindustrie. *Papierfabr.* 29: 509-516 (1931). 64 footnotes.

KUERSCHNER, K., and HOFFER, A. Eine neue quantitative Cellulosebestimmung. *Chem.-Ztg.* 55: 162 (1931).

LEVINSTEIN, HERBERT. Films and fibers derived from cellulose. *Trans. Instn. Chem. Eng.* 8: 32-37 (1930). Classified.

CELLULOSE—Cont'd

LUDTKE, MAX. Untersuchungen über Aufbau und Bildung der pflanzlichen Zellmembrane und ihrer stofflichen Komponenten. *Biochem. Z.* 233: 1-57 (1931). Bibl. footnotes.

MEYER, KURT H., and MARK, H. Ueber den Bau des kristallisierten Anteils der Cellulose. *Cellulosechemie* 9: 61-74 (1928). 52 footnotes. II. 11: 91-100 (1930). 37 footnotes.

MITCHELL, ESTHER MARTHA. A microchemical study of hemicelluloses of endosperms and cotyledons. *Am. J. Botany* 17: 137-138 (1930).

MOOSDORF, WALTER. Sammelreferat über die in deutschen Fachzeitschriften erschienene Literatur zur Chemie der Cellulose und der Papier- und Zellstoff-Fabrikation für den Zeitraum von 1. Oktober, 1927, bis 31. März, 1928. *Tech. Chem. Papier- u. Zellstoff-Fabr.* 25: 52-59 (1928). 64 references. 1. April bis 31. Dezember, 1928. *Ibid.* 26: 96-102, 113-120 (1929). 161 footnotes. 1. Januar bis 30. June, 1929. *Ibid* 27: 37-43, 71-78, 88-95 (1930). 217 footnotes. 1. Juli bis 31. Dezember. 1929. *Ibid* 27: 153-166 (1930). 215 footnotes.

MURNEEK, A. E. Hemicellulose as a storage carbohydrate in woody plants with special reference to the apple. *Plant Physiol.* 4: 262-264 (1929). 29 references.

RASSOW, B., and AEHNELT, W. Spektographische Untersuchungen an Cellulosederivaten. *Cellulosechemie* 10: 169-195 (1929). 87 footnotes.

SCHMIDT, ERICH, *et al.* Ueber die ganz-zahlige Beziehung der Cellulose zu dem schwerlöslichen Xylan in der Skeletsubstanz der Rotbuche. *Cellulosechemie* 11: 49-68, 73-79 (1930). 95 footnotes.

SPONSLER, O. L., and DORE, W. H. Die Struktur der Rameicellulose abgeleitet aus den Untersuchungen mit Röntgenstrahlen. *Cellulosechemie* 11: 186-197 (1930). 39 footnotes.

STAUDINGER, H. Zur Konstitution hochmolekularer Verbindungen, speziell der Cellulose. *Ber.* 64B: 1688-1697 (1931). 46 footnotes.

STAUDINGER, H., *et al.* Ueber hochpolymere Verbindungen. 39. Ueber Cellulose. *Ber.* 63B: 2308-2316 (1930). 68 footnotes.

STAUDINGER, H., and SCHWEITZER, O. Ueber die Molekülgrösse der Cellulose. *Ber.* 63B: 3132-3154 (1930). 98 footnotes.

WAENTIG, P. Ueber die Wirkung chemischer Agenzien, insbesondere oxydativer Einflüsse auf das Verhalten der

Cellulose. *Cellulosechemie* 10: 81-85 (1929). 35 footnotes.

ZEMPLÉN, GÉZA. Cellulose. In *Abderhalden, Biochem. Handl.* 13: 108-183 (1931). Numerous bibl. footnotes.

See also COTTON, PAPER.

CELLULOSE: Bacteria, Action of

TETRAULT, P. A. Decomposition of cellulose in nature. *Proc. Indiana Acad. Sci.* 39: 148-151 (1929). 68 references.

WAKSMAN, SELMAN A., and SKINNER, C. E. Microorganisms concerned in the decomposition of celluloses in the soil. *J. Bacteriology* 12: 80-84 (1926). 80 references.

CELLULOSE ACETATE

KRÜGER, D. Die Viskosität von Celluloseazetaten. *Farbe u. Lack* 1930: 88, 101-102. 42 references.

STAUDINGER, H., and FREUDENBERGER, H. Ueber hochpolymere Verbindungen. 41. Molekulargewichts-Bestimmungen an Acetyl-cellulosen. *Ber.* 63B: 2331-2343 (1930). 37 footnotes.

See also PLASTICS.

CELLULOSE ESTERS AND ETHERS

BERL, E., and SCHUPP, H. Zur Kenntnis der Celluloseäther. *Cellulosechemie* 10: 41-59 (1929). 52 patents.

GEIGER, E. Zur Kenntnis der Cellulose-xanthogenate. *Helv. Chim. Acta* 13: 281-303 (1930). 60 references.

KRÜGER, DEODATA. Zur Kenntnis der Nitroacetate der Cellulose. *Cellulosechemie* 11: 220-228 (1930). 26 footnotes.

CEMENT

DAVIS, R. E. Summary of the results of investigations having to do with volumetric changes in cements, mortars and concretes due to causes other than stress. *J. Am. Concrete Inst.* 1: 440-443 (1930).

HONUS, O. F. Sur la thermochimie du ciment portland. *Chimie et industrie* 26: 1011-1022 (1931). 63 footnotes.

HONUS, O. F., and RUZICKA, G. Scientific and technical research on cement during 1929. *Cement* 3: 1316-1326, 1623 (1930). 116 references.

PLATSMANN, C. R. Zementforschung im Jahre 1928. *Zement* 18: 639-640 (1929). 81 references. 1929. 19: 722-724, 843-847 (1930). 129 footnotes.

PORTLAND CEMENT ASSOCIATION. Report of the director of research. Chicago, 1928. "List of research publications and papers," 1917-1928, in report for 1928, p. 203-210.

RICHARZ, H. Zementveredelung-Betonveredelung. *Zement* 17: 1348-1351, 1377-1382, 1411-1414 (1928). 49 footnotes.

ROSSMAN, J. Manufacture of hydraulic cement: a review of United States patents. *Rock Products* 34, no. 23: 46-50 (1931). 102 patents.

SEARLE, ALFRED B. The colloidal nature and properties of cements and mortars. *In* Alexander, *Colloid Chemistry III*: 410-412 (1931). 138 references.

THOMAS, W. N., and DAVEY, N. Effect of temperature on the setting times of cements and on the strength of cements, mortars and concretes. *Dept. Sci. Ind. Research, Building Research Special Report No. 13*. 1929. 38 p. *Bibl.*, p. 36-38. 52 references.

TIPPMANN, F. F. Kurze Betrachtungen über das Kalkhydrat und seine Rolle beim Erhärtungsvorgang des Portlandzementes. *Kolloid-Z.* 55: 106-107 (1931). 67 references.

WECKE, FRIEDRICH. Zement. Dresden, Steinkopff, 1930. 93 p. *Bibl.* footnotes. Contains a patent index.

CEMENT: Analytical*

DIEPSCHLAG, E., and MATTING, A. Die Bestimmung des freien Kalkes in Schlacken und Zementen. *Zement* 17: 1375-1376 (1928). 129 references.

CEMENTITE* See IRON OXIDES (Rals-ton).

CERAMICS

ALLI, ABDE. Natural colors of fired clays. *J. Indian Ceram. Soc.* 3: 30-33 (1931). 56 references.

BOLLENBACH, H., and KIEFFER, E. Laboratoriumsbuch für die Tonindustrie. 2. Aufl. Halle, Knapp, 1929. 96 p. *Bibl.*, p. 92-94.

COHN, WILLI M. Ueber Wärmeleitfähigkeit, Wärmeausdehnung, spezifische Wärme und einige andere thermische Eigenschaften von Mineralien und keramischen Massen. *Ber. deut. keram. Ges.* 9: 239-299 (1928). 178 footnotes.

COHN, W. M. Untersuchungen des Ausdehnungsverhalten einiger keramischer Massen. *Keram. Rundschau* 38: 275-279, 329-332, 360-364 (1930). 58 footnotes.

COLE, SANFORD S. Thermal expansion of silica brick and mortars. *J. Am. Ceram. Soc.* 13: 445-446 (1930). 56 references.

FOSDICK, MARION L. Bibliography of papers appearing in the Transactions, Journal, and Bulletin of the American Ceramic Society, which are concerned with low temperature work and are of interest to members of the art division. *J. Am. Ceram. Soc.* 13, no. 5, pt. 2: 59-66 (1930).

HALL, F. P. The casting of clay ware—A résumé. *J. Am. Ceram. Soc.* 13: 765-766 (1930). 46 references.

KONARZEWSKI, JERZY. Advances in ceramics. *Przemysl Chem.* 13: 168-177 (1929).

MCBURNEY, J. W. The weathering of structural clay products: a review. *Proc. Am. Soc. Testing Materials* 31, pt. II: 756-758 (1931). 48 references.

MIELDS, M. Fortschritte der Keramik im Jahre 1928. *Fortschrittsber. Chem.-Ztg.* 1929: 86-96. 206 footnotes. 1929. 1930: 86-95. 180 footnotes. 1930. 1931: 61-68. 174 footnotes.

NAVIAS, LOUIS. Porcelain and allied ceramic bodies. *In* Alexander, *Colloid Chemistry III*: 349-350 (1931). 94 references.

PARSONS, DOUGLAS E. Bibliography on the weathering of structural clay products. *Proc. Am. Soc. Testing Materials* 31, pt. II: 825-834 (1931). 63 references.

RIEKE, R., and WIESE, O. Die Anfärbemethode in der Keramik und bei Mineraluntersuchungen. *Ber. deut. keram. Ges.* 9: 153-155 (1928). 50 references.

ROEMER, MARY V. Ceramic technology, a selected list. *St. Louis, Public Library, Monthly Bull.*, 27: 2-4 (1929).

SINGER, F. Keramische Farben. *In* Ullman, *Enzyk. tech. Chem.*, 2d ed., 4: 814-838 (1929). Several hundred footnote references. *Bibl.*, p. 838.

STEGER, W. Technische Fortschritte der Feinkeramik im Jahre 1929. *Keram. Rundschau* 38: 33-37, 54-56, 71-72 (1930). 114 footnotes.

Supplement to catalogue of the ceramic library. North Staffordshire Technical College, Stoke-on-Trent. 1930. 95 p.

WEST, CLARENCE J., and BEROLZHEIMER, D. D. Bibliography of bibliographies (of ceramics). *Bull. Am. Ceramic Soc.* 10: 211-244 (1931). Excerpts from *Bulls.* 50 and 71 of the National Research Council, with some additional titles.

See also MINERALOGY (Reike), ABRA-SIVES, CLAY, GLASS, REFRACTORIES, SAGGERS, SILICA.

CEREALS

LUERS, HEINRICH. Studien über die Reifung der Cerealien. *Biochem. Z.* 104: 30-81 (1920). *Bibl.* footnotes.

MIX, ARNOLD. Neuere Untersuchungen über die Ausbildung von Rohprotein, Rohfett und Spelzen in Haferkorn. *Landw. Jahrb.* 73: 837-840 (1931).

CEREALS—Cont'd*Serial*

Siebel Technical Review; a quarterly digest of technical and industrial progress in baking and milling, carbonated cereal beverages, refrigeration and the food industries. 1+. 1926+.

CEREALS: Analytical

LE CLERC, J. A. Report on (the analysis of) cereal products. J. Assoc. Official Agr. Chem. 12: 378-387 (1929). 59 references and 20 patents, covering 1927-1928.

CEREBROSIDES. *See* LIPOIDS.**CEREBROSPINAL FLUID**

KERMACK, WM. O., and VOGEL, CECIL I. B. The colloidal gold and colloidal gum benzoïn tests in the cerebrospinal fluid. Edinburgh Med. J. 36: 105-110 (1929).

LEVINSON, ABRAHAM. Cerebrospinal fluid in health and disease. St. Louis, Mosby, 1929. 386 p. Bibl. at end of each chapter.

WRIGHT, S. L., JR., HERR, E. F., and PAUL, J. R. Optical activity of cerebrospinal fluid in suppurative meningitis and its lactic acid, sugar and chloride content. J. Clinical Investigation 9: 458-461 (1930). 57 references.

See also GOLD: BIOLOGY.

CERIUM. *See* MONAZITE.**CESIUM**

SANTMYERS, R. M. Caesium, rubidium and lithium. U. S. Bureau of Mines, Information Circular 6215. 1930. 17 p. Bibl., p. 13-17. 21 references on caesium; 6 references on rubidium; 38 references on lithium.

CHEESE

GUITTENNEAU, G. Les présures commerciales dans la fabrication des fromages à patec cuite. Lait 6: 266-268 (1926). 36 references.

HAWESSON, J. L'influence du lab-ferment sur la maturation du fromage. Lait 9: 510-511 (1929). 31 references.

ROEDER, GEORGE. Die wichtigsten Untersuchungen in der Sauermilchkäserei, ihre praktische Bedeutung und Auswertung. Hildesheim, Molckerei-Ztg., 1929. 64 p. Bibl., p. 64.

SANSONETTI, F. Sur les flores bactérienne et fongique des caillés de lait; rôle des symbioses dans la maturation du Camembert. Lait 10: 1116-1123 (1930).

WEIGMANN, H., *et al.* Die Käserei. In Winkler, Handb. Milchwirtschaft

2, pt. 2: 156-158, 190-191, 234-236, 244-245, 268-270 (1931).

WILSTER, GUSTAV. Clarification of milk for American cheddar cheese. Iowa State Coll. J. Sci. 4: 211-213 (1930). 42 references.

See also DAIRY PRODUCTS, MILK.

CHEMICAL APPARATUS

FÜRTH, ARTHUR. Die Werkstoffe für den Bau chemischer Apparate. Leipzig, Spamer, 1928. 220 p. Bibl., p. 215-216.

SOCIETY OF CHEMICAL INDUSTRY. General, plant and machinery. In Reports on the progress of applied chemistry 14: 5-28 (1929); 123 footnotes. 15: 5-29 (1930); 120 footnotes.

WINKLER, L. W. Ausgewählte Untersuchungsverfahren für das chemische Laboratorium. Stuttgart, Enke, 1931. 155 p. Bibl., p. vii-ix.

See also COLLOID MILL, EXTRACTORS, FILTRATION, etc.

CHEMICAL EQUILIBRIUM

HILL, ARTHUR E. Heterogeneous equilibrium. In Taylor, Treatise on Physical Chemistry, 2nd ed., I: 467-589 (1931). Bibl. footnotes.

CHEMICAL KINETICS. *See* KINETICS.**CHEMICALS**

HACKSPILL, LOUIS. Petite industrie chimique (industrie des métalloïdes). Paris, Baillière, 1926. 835 p. Bibl. footnotes.

See also ACIDS, ALKALIS and SALTS, Names of individual chemicals.

CHEMOTHERAPY

BROWNING, C. H. Chemotherapy. In Medical Research Council (Gt. Brit.), System of Bacteriology in Relation to Medicine, 6: 534-537 (1931).

COFMAN, VICTOR. Les préparations à base de plomb dans le traitement du cancer. Neoplasmes 9: 39-40 (1930). 54 references.

FINDLAY, GEORGE M. Recent advances in chemotherapy. London, Churchill, 1930. 532 p. Contains "references."

HOYLE, J. C. Treatment of experimental tuberculosis by calcium administration. Quart. J. Med. 22: 468-459 (1929). 77 references.

JACKSON, H. Recent advances in the biology of cancer. New England J. Med. 201: 294-303 (1929). Bibl. on chemistry of malignant diseases, vitamins and chemotherapeutics.

KOLLE, W., and ZIEGLER, K. Handbuch der Salversantherapie. Berlin, Urban und Schwarzenberg, 1924-1925. 2 vols. Bibls. as follows: I: 239-342, 474-484, 554-561, 581-586, 603-606, 633-

- 639, 678-680, 698-701, 735-750; II: 51-72, 104-115, 187-206, 224-228, 243-258, 296-302, 324-329, 350-353, 372-374, 395-402, 414-417, 430-431, 464-475, 491-494, 520-526, 534-535, 543-544, 572-576, 600-607, 616-618, 622-624, 626, 630-631, 634-635, 640-643, 676-681, 722-727, 771-785, 804-806, 834-836.
- KOPPELMAN, A. New developments in the chemotherapy of tuberculosis and psoriasis (gold and other metallo-organic compounds). *J. Chemotherapy* 6: 95-96 (1929). 39 references.
- KOPPELMAN, A. Recent developments in the chemotherapy of protozoan infections other than syphilis. *J. Chemotherapy* 5: 93-94 (1928). 60 references.
- KOPPELMAN, A., and RAIZISS, G. W. Recent developments in experimental rabbit syphilis and chemotherapy of syphilis. *J. Chemotherapy* 4: 135-136 (1927). 31 references.
- LEVADITI, C. Le bismuth dans le traitement de la syphilis. Paris, Masson et Cie, 1924. 316 p. Numerous bibl. footnotes.
- MEDICAL RESEARCH COUNCIL, Gt. Brit. *Salvarsan Committee*. Toxic effects following the employment of arsenobenzol preparations. Special Report Series, No. 66. 1922. 94 p. Bibl., p. 87-94.
- RAIZISS, W. G., and KOPPELMAN, A. Reactions following the administration of arspenamine and its derivatives. *J. Chemotherapy* 4: 16-17, 63-64 (1927). 77 references.
- Recent developments in the chemotherapy of syphilis. *J. Chemotherapy* 5: 21-22, 52-54 (1928). 109 references.
- SACHS, HANS. Grundlagen der Chemotherapie. In Oppenheimer, Handb. Biochem., 2nd ed., 3: 91-115 (1925). 150 footnotes.
- SCHLOSSBERGER, H., and MENK, W. Therapeutic effectiveness of gold compounds in spirochetal and typanosomic diseases. *J. Chemotherapy* 8: 55-56 (1931). 50 references.
- SCHNITZER, R. Chemotherapie. Deut. med. Wochschr. 52: 69-71, 242-243, 289-291, 2084, 2127-2128, 2171-2172 (1926); 54: 878-879, 1001-1002 (1928). 333 references.
- SCHNITZER, R. Fortschritte in der chemotherapeutischen Bekämpfung der Tuberkulose. *Z. angew. Chem.* 43: 744-747 (1930). 36 footnotes.
- Syphilis, treatment of, with bismuth, mercurials, salvarsan, etc. Index-Cat., S. G. O., 3rd ser., 10: 28-31, 93-131 (1932).
- See also ARSENIC: ORGANIC COMPOUNDS, ARSPHENAMINE, PHARMACEUTICALS.
- CHITIN**
- CAMPBELL, F. L. The detection and estimation of insect chitin and the relation of "chitinisation" to hardness and pigmentation of the cuticula of the American cockroach, *Periplanets americana* L. *Ann. Entomol. Soc.* 22: 424-426 (1929). 60 references.
- CHLORAL HYDRATE ***
- PFANKUCH, E. Chloralhydrat (Pharmakologie). In Houben, Fortschritte der Heilstoffchemie, Zweite Abteilung, Bd. I: 526-560 (1930). Bibl. footnotes.
- CHLORAMINES**
- BERLINER, J. T. F. Chemistry of chloramines. *J. Am. Water Works Assoc.* 23: 1332-1333 (1931). 33 references.
- CHLORIDES: Biochemistry.* See BIOCHEMISTRY** (Peters and Van Slyke).
- CHLORINATION ***
- COHN, G. Chlorieren. In Ullmann, Enzyk. tech. Chem., 2nd ed., 3: 321-332 (1929). References through text.
- EGLOFF, G., SCHAAD, R. E., and LOWRY, C. D., JR. The halogenation of paraffin hydrocarbons. *Chem. Reviews* 8: 75-80 (1931).
- CHLORINE**
- DRTZ, HUGO. Chlor. In Ullmann, Enzyk. tech. Chem., 2nd ed., 3: 204-232 (1929). References through text.
- PASCAL, PAUL. Synthèses et catalyses industrielles; fabrications minerales. 2. ed. Paris, Hermann, 1930. 456 p. Contains bibl.
- CHLORITES**
- ORCEL, J. Recherches sur la composition chimique des chlorites. *Bull. soc. franc. minéral.* 50: 428-448 (1927). 243 references.
- CHLOROFORM**
- PFLUG, HANS. Pharmakologie des Chloroforms. In Houben, Fortschritte der Heilstoffchemie, Zweite Abt., Bd. I: 39-125 (1930). Bibl. footnotes.
- CHLOROHYDRINS**
- GIBSON, G. P. Preparation, properties and uses of glycerol derivatives. III. The chlorohydrins. *Chemistry and Industry* 50: 949-954 (1931). 29 footnotes.
- CHLOROPICRIN**
- GERSDORFF, W. A. Supplement to chloropicrin bibliography. U. S. Dept. Agr., Bureau of Chemistry and Soils, Insecticide Division. Oct., 1930. 19 p. 80 references, annotated.
- CHLOROSIS: Plant ***
- DAVIS, EVERETT F. Some chemical and physiological studies on the nature

CHLOROSIS: Plant *—Cont'd

and transmission of "infectious chlorosis" in variegated plants. *Annals Mo. Botanical Garden* 16: 211-213 (1929).

CHOLESTEROL

CUNY, L. La constitution moléculaire du cholestérol et la chimie des acides biliaries. *J. pharm. chim.* 8: 82-85 (1928). 107 references.

ELMAN, ROBERT, and TAUSSIG, J. B. Cholesterol function of the gall bladder. *J. Exptl. Med.* 54: 786-787 (1931). 51 references.

FEX, JOHAN. Chemische und morphologische Studien über das Cholesterin und die Cholesterinester in normalen und pathologisch veränderten Organen. *Biochem. Z.* 104: 82-174 (1920). 103 footnotes.

GRUNKE, WILHELM. Ueber die Ausscheidung des Cholesterins im Harn. *Biochem. Z.* 132: 543-555 (1922). 39 footnotes.

MULLER, GULL L. Cholesterol metabolism in health and in anemia. *Medicine* 9: 165-174 (1930). 364 references.

REMESEV, IGER. Physikalisch-chemische Untersuchungen über den kolloidalen Zustand des Cholesterins, Cholesterinesters und Lecithin. I-IV. *Biochem. Z.* 218: 86-190 (1930). *Bibl. footnotes.*

ROSZTOCZY, E. VON. Ueber das Verhalten des freien und Ester-Cholesterins im Blute und in den Organen des Kaninchens bei künstlicher Gallenstauung. *Z. ges. exptl. Med.* 68: 690-700 (1929). 75 references.

See also BLOOD CHOLESTEROL.

CHOLINE

PFANKUCH, E. Cholin (Pharmakologie). In Houben, *Fortschritte der Heilstoffchemie*, Zweite Abt., Bd. I: 1097-1163 (1930). *Bibl. footnotes.* Includes esters and derivatives.

SICKEL, HANS. Cholin. In *Abderhalden, Biochem. Handl.* 12: 214-229 (1930). *Bibl. footnotes.*

CHROMATES *

MELLOR, J. W. Chromates, monochromates, dichromates, trichromates, tetrachromates. In *his Inorg. Theor. Chem.* 11: 314-323, 345-349, 351, 352, 361 (1931).

CHROMITE

DOELTER, C. Chromit. In *his Handb. Mineralchem.* 4, pt. 2: 680-715 (1927). *Bibl. footnotes.*

DONATH, JOHANNES MARTIN. Geologisch-mineralogische Studien an serbischen Chromitlagerstätten. *Diss., Sächsische Bergakademie Freiberg*, 1930. 61 p. *Bibl.*, p. 59-61.

CHROMIUM

DITTLER, E., and DOELTER, C. Chrom und Chromverbindungen. In *Doelter, Handb. Mineralchem.* 4, pt. 2: 671-743 (1929). *Bibl. footnotes.*

JOHNSTON, WM. D., JR. Chromium. *Mineral Ind.* 37: 81-83 (1928). 50 references. 38: 80-81 (1929). 29 references. 39: 77 (1930). 17 references.

MELLOR, J. W. Chromium. In *his Inorg. Theor. Chem.* 11: 122-483 (1931). History and occurrence, p. 126-129; extraction, p. 132-133; preparation, p. 139-142; physical properties, p. 155-160; chemical properties, p. 166-167; atomic weight and valency, p. 169-170. The remainder of the chapter is devoted to compounds of Cr.

CHROMIUM ALLOYS *

MELLOR, J. W. Chromium alloys. In *his Inorg. Theor. Chem.* 11: 173 (1931).

CHROMIUM AMMINES

MELLOR, J. W. The chromium ammines. In *his Inorg. Theor. Chem.* 11: 409-410 (1931).

CHROMIUM BROMIDES *

MELLOR, J. W. Chromium bromides and oxybromides. In *his Inorg. Theor. Chem.* 11: 426-427 (1931).

CHROMIUM CHLORIDES

MELLOR, J. W. Chromium chlorides. In *his Inorg. Theor. Chem.* 11: 387-390, 399-400, 420-421 (1931).

CHROMIUM FLUORIDES *

MELLOR, J. W. Chromium fluorides and oxyfluorides. In *his Inorg. Theor. Chem.* 11: 364, 366 (1931).

CHROMIUM NITRATES *

MELLOR, J. W. Chromium nitrates. In *his Inorg. Theor. Chem.* 11: 478-479 (1931).

CHROMIUM OXIDES

MELLOR, J. W. Chromium oxides. In *his Inorg. Theor. Chem.* 11: 175-176, 183-185, 194-196, 204-206, 210-211, 225-228, 238-240 (1931).

CHROMIUM PLATING *

EGER, G. Galvanotechnik. In *Ullmann, Enzykl. tech. Chem.*, 2nd ed., 5: 476-519 (1930). Many references, especially patents, through text; German patents on chromium plating, p. 502-503.

FREEMAN, BENJAMIN, and HOPPE, FREDERICK G. Electroplating with chromium, copper and nickel. New York, Prentice-Hall, 1930. 212 p. *Bibl.*, p. 203-206.

GARDAM, G. E. Survey of the published information on chromium plating. *Elec. R. (London)* 10: 717-718 (1929); *Chem. Age (London)* 20:

354-355 (1929); Brass World 25: 105-107 (1929); Engineer (Metallurgist) 147:75-76 (1929).

MACCHIA, O. La porosità dei depositi elettrolitici de cromo. *Ind. chimica* 4: 874-880 (1929). 202 footnotes. Cf. *Chem. News* 141:1-7 (1930).

See also ELECTROPLATING.

CHROMIUM SULFATES

MELLOR, J. W. Chromium sulphates. *In his Inorg. Theor. Chem.* 11: 450-451, 469-471 (1931).

CINCHOPHEN*

GRABFIELD, G. P., and PRATT, J. H. Action of cinchophen. *J. Pharmacol.* 42: 437-439 (1931). 40 references.

CINNAMIC ALDEHYDE

Zimtaldehyd. *In* Wagner, *Die Aldehyde*, 1929; 670-728. 242 footnotes.

CITRAL

Zitral. *In* Wagner, *Die Aldehyde*, 1929: 294-401. 340 footnotes.

CITRIC ACID

CHALLENGER, F. The production of citric acid by fermentation process. *Ind. Chemist* 5: 184 (1929). 37 references.

See also FERMENTATION (Smyth); PLANTS: COMPOSITION.

CITRONELLA OIL*

HOFSTEDE, H. W. Citronella-olie. *Mededeelingen van de Afdeling Nijverheid*, No. 4, Dept. van Landbouw, Nijverheid en Handel. 1928. 189 p. Contains a bibl.

CITRONELLAL

Zitronellal. *In* Wagner, *Die Aldehyde*, 1929: 212-284. 250 footnotes.

CLAYS

ALLAM, FATHALLA. Beitrag zur Kenntnis der Beeinflussung der Dispersität des Tones durch Elektrolyte. *Chemie der Erde* 5: 276-318 (1930). 61 footnotes.

Bibliography of clay and silica industry. Coburg, Müller and Schmidt, 1929. 72 p.

BOEGE, HERMANN. Ueber den Kaolingegehalt von Tonen. *Chemie der Erde* 3: 368-369 (1928). 28 references.

CURTIS, CARL E. The electrical de-watering of clay suspensions. *J. Am. Ceram. Soc.* 14: 257-262 (1931). 108 references. Schwerin's patents are also listed.

HIND, S. R. The plasticity of clay. I. Mechanical methods of measurement. *Trans. Ceram. Soc.* 29, no. 5: 206-207 (1930). About 35 references.

MAUTZ, PAUL H. The function of peptizing protective colloid in the casting of clay slips. *Ohio State Univ., Eng. Expt. Sta., Bull.* No. 55. 1930. 14 p. Bibl., p. 11-14.

MERTZ, ELLEN LOUISE. Lillebeltsler og London clay. *Danmarks geologiske undersøgelse*, II række, Nr. 51. 1928. 66 p. Bibl. footnotes.

SALMANG, H. Ton und Wasser. *Kolloid-Z.* 48: 377-380 (1929). 33 footnotes.

SHAW, JOSEPH B. Fire clays of Pennsylvania. *Pa. Geol. Survey, Bull.* M-10. 1928. 69 p. Bibl., p. 66-69.

SHAW, JOSEPH B. The ceramic industries of Pennsylvania. *Pa. State College, Mineral Industries Expt. Sta., Bull.* 7. 1930. 203 p. Bibl., p. 200-203.

TYLER, PAUL M. Clay. *U. S. Bur. Mines, Circular* No. 6155. July, 1929. 63 p. Mimeographed. Bibl., p. 53-63.

VICKERS, A. E. The application of colloid chemistry to the study of clays. *Trans. Ceram. Soc.* 28: 97-100, 143-147 (1929). About 200 references.

See also KAOLIN.

CLEANING.* See DRY CLEANING.

COAGULATION

DESAL, B. N. The kinetics of coagulation. *Trans. Faraday Soc.* 24: 181-195 (1928). 26 footnotes.

COAL

DOLCH, M. Die Kohlen. *In* Doelter, *Handb. Mineralchem.* 4, pt. 3: 469-559 (1930). Bibl., footnotes.

DUPARQUE-LILLE, A., et al. Fusit; Vorkommen, Entstehung und praktische Bedeutung der Faserkohle. Stuttgart, Enke, 1929. 139 p. Bibl. references throughout.

FIELDNER, A. C., and VON BERNEWITZ, M. W. Bibliography of United States Bureau of Mines investigations on coal and its products, 1910-1930. *U. S. Bur. Mines, Tech. Paper* 493. 1931. 56 p. Author and subject index. 753 citations.

FUCHS, WALTER. *Die Chemie der Kohle*. Berlin, Springer, 1931. 510 p. Bibl. footnotes.

FUCHS, W., and HORN, O. Zur Frage der Entstehung der Steinkohlen. *Z. angew. Chem.* 44: 182-183 (1930). Bibl. on synthesis of coal.

FULWEILER, W. H., and CLEVELAND, T. K. The agglutinating value of American coals. *Proc. Am. Gas Assoc.*, 1927: 1406. 41 references.

GUS'KOV, V. A. Up-to-date methods in the investigation and concentration of

COAL—Cont'd

- coal. Trans. First All-Russian Sci.-Tech. Mining Congr., 1926, 3:96-124 (1928). 38 references.
- HORN, O. Ueber den oxydativen Abbau von Kohlen zu definierten organischen Substanzen. Brennstoff-Chem. 10: 364 (1929); Ges. Abhandl. Kenntnis Kohle 9: 339-347 (1930). 31 references.
- MARSHALL, S. M., and BIRD, B. M. Test for measuring the agglutinating power of coal. Am. Inst. Mining Met. Eng., Tech. Publ. 216: 44-46 (1929); Coal Div., Trans., 1930: 381-383. 39 references.
- MENZEL, A. Literatur über die Einwirkung chemischer Agentien auf Kohle und Kohlenstoff. Ges. Abh. Kenntnis Kohle 9: 308-338 (1930). Several hundred footnotes.
- SCHUSTER, FRITZ. Asche, Elementarzusammensetzung und Heizwert von Kohle. Gas- u. Wasserfach 74: 635 (1931). 38 references.
- Selected bibliography on anthracite coal. New York, Anthracite Operators' Conference, 1929. 50 p.
- SEYLER, CLARENCE A. The microscopic examination of coal. Gt. Brit., Dept. Sci. Ind. Research, Fuel Research Board, Phys. and Chem. Survey of the National Coal Resources, No. 16. 67 p. Bibl., p. 39-40.
- SHOCHAN, J. B. Present-day knowledge of the chemical constitution of coal. U. S. Bur. Mines, Information Circ., 6212. 1929. 40 references, p. 11-14.
- STADNIKOFF, GEORG. Die Chemie der Kohlen. Stuttgart, Enke, 1931. 339 p. Bibl. footnotes.
- STADNIKOFF, GEORG. Die Entstehung von Kohle und Erdöl. Stuttgart, Enke, 1930. 254 p. Bibl. footnotes.
- See also PETROLEUM (Thom).
- COAL: Analysis.**
- DOLCH, MORITZ. Brennstofftechnisches Praktikum. Halle, Knapp, 1931. 148 p. Bibl., p. 140-144.
- PERROTT, G. ST. J. Recent developments in coal testing. Proc. Am. Gas Assoc. 1930: 1187-1188. 60 references.
- COAL: Carbonization.**
- ASKEW, HENRY OSCAR. Report on the Fischer process. New Zealand J. Sci. Tech. 10: 101-110, 154-163 (1928). 51 references.
- BARASCH, M. The coking of coal. J. Soc. Chem. Ind. 48: 174-183T (1929). Footnotes and references through text.
- Bibliography of recent low-temperature carbonization activities. Proc. Am. Gas Assoc. 1928: 1216-1226. Classified by processes.
- BROWN, P. D. Classified subject index of American Gas Association Carbonization Committee reports and related subject matter for the years 1903 to 1927, inclusive. Proc. Am. Gas Assoc. 1928: 1159-1163.
- DAVIS, JOSEPH D. Recent scientific research in low-temperature carbonization with particular reference to the mechanism of coking. Proc. Am. Gas Assoc. 1927: 1273-1279. 40 footnotes.
- Low temperature carbonization—bibliography. N. E. L. A., Proc. 1927: 885-889.
- STUART, MURRAY. Low-temperature carbonization (or distillation) explained. London, Mining Publs., 1929. 56 p. Bibl., p. 55-56.
- COAL: Liquefaction.**
- ALTPETER, J. Pantentliteratur über Kohlehydrierung. Metallbörse 20: 2467-2468, 2515-2516 (1930).
- BUGGE, G. Kohleveredlung. In Ullmann, Enzyk. tech. Chem., 2nd ed., 6: 643-670 (1930). References through text; classified patent list, p. 656-670.
- CRAWFORD, A., WILLIAMS, F. A., KING, J. G., and SINNATT, F. S. The action of hydrogen upon coal. Dept. Sci. Ind. Research, Fuel Research Board, Tech. Paper No. 29. 1931. 37 p. Bibl., p. 34-37. 125 references.
- MÜLLER, F. Bemerkungen über den derzeitigen Stand der Veredlung der Steinkohle. Petroleum 25: 1310-1316 (1929); Erdöl u. Teer 5: 102-104, 118-119, 136-137 (1929). 32 footnotes.
- MÜLLER, FRITZ. Die Entwicklung der Veredlung der Steinkohle in den letzten Jahren. Stahl u. Eisen 51: 1001-1005 (1931). 45 references.
- ROSENDAHL, F. Die chemische Ausnutzung der Kohle. III. Hydrierung. 2. Teil. Patentschriften. Metallbörse 21: 2105-2106, 2137-2138, 2169-2171 (1931); 22: 17-18 (1932).
- COAL: Pulverized.**
- BLEIBTREU, HERMANN. Kohlenstaubeuerungen. 2. Aufl. Berlin, Springer, 1930. 495 p. Bibl. footnotes.
- COAL: Washing.**
- RICHARDS, R. H., and LOCKE, C. E. Progress in ore dressing and coal preparation. Mineral Ind. 37: 706-722 (1928); 38: 747-766 (1929); 39: 711-724 (1930).
- COAL TAR**
- BRÜCHNER, HORST. Zur Kenntnis der Phenole des Steinkohlenteers. Erdöl u. Teer 4: 562-564, 580-583, 598-602 (1928). 45 footnotes.
- DAVIS, J. D. Low-temperature tar, 1927 to date. Proc. Am. Gas Assoc. 1928: 1196-1197. 40 references.

HEYDENREICH, F. A. Die deutsche Steinkohlenteerindustrie und ihre wissenschaftlichen Zusammenhänge. Halle, Knapp, 1931. 256 p. Bibl., p. xiv-xvi.

Study of the tars and oils produced from coal. Dept. Sci. Ind. Research, Fuel Research, Tech. Paper. No. 32. 1931. 124 pages. Bibl., p. 57-58. 59 references.

WEISE, ERNST. Neuerungen und Erfindungen in der Teerdestillation. Asphalt u. Teer 30: 1124-1127, 1147-1149, 1169-1170, 1232-1235, 1287-1292, 1312-1315 (1930). 106 patent references through text.

See also PITCH.

COBALT

DRURY, C. W. Cobalt. Mineral Ind. 37: 121-122 (1928). 21 references. 38: 115 (1929). 12 references. 39: 114-115 (1930). 32 references.

HESS, FRANK L. Cobalt. Mineral Resources of the U. S., 1927, I: 396-397. 18 references.

Kobalt. Gmelins Handbuch anorg. Chemie. 8th ed. Systemnummer 58. Pt. 1. 1931. 220 p. Includes properties of the metal and its alloys.

TYLER, PAUL M. Cobalt. U. S. Bur. Mines, Information Circ. 6331. 1930. 33 p. Bibl., p. 29-33.

COBALTAMMINES

Cobalt. Part B. Cobaltamines. Gmelins Handbuch der anorganischen Chemie. 8th ed. Systemnummer 58. 1930. 376 p. Covers literature to end of 1929.

COCAINE

RENTZ, EDUARD. On phasic introductory and release effects of the cocaine group on vessel preparations. J. Am. Inst. Homeopathy 24: 904-916 (1931). 656 references.

TRIER, GEORGE. Alkaloide der Cocablätter. Cocain. In *his* Die Alkaloide, 2. Aufl., 311-334 (1931). Bibl. footnotes.

COD-LIVER OIL

MANNING, JOHN R. Bibliography on cod-liver oil in animal feeding with non-critical comments and abstracts. U. S. Bureau of Fisheries Doc. No. 1065. 1929. p. 333-365. Bibl., p. 352-365.

WAHLIN, BERNHARD. Toxic effects of cod liver oil in the organism. Acta Med. Scand. 74: 445-446 (1931). 36 references.

See also TETANY.

COELESTIN *

DOELTER, C. Coelestin. In *his* Handb. Mineralchem. 4, pt. 2: 205-226 (1927). 59 footnotes.

COFFEE

MÜLLER, EDGAR. Arabiens Vermächtnis; Tatsachen und Dokumente über den Kaffee aus Ernährungswissenschaft und Rechtssprechung. Hamburg, Holler, 1931. Bibl., vol. 1: 118-121.

MÜLLER, EDGAR. Kaffee und Rosten. Hamburg, Kateka-Verlag Dr. A. Rüter, 1929. 416 p. Bibl., p. 405-406.

SCHULTE, ROBERT W. Der Einfluss des Kaffees auf Körper und Geist. Dresden, Verlag des deutschen Hygiene-Museums, 1929. 101 p. Bibl., p. 95-102.

COHESION *

DESCH, C. H. Cohesion: A general survey. Trans. Faraday Soc. 24: 53-64 (1928). 50 footnotes.

DUSHMANN, SAUL. Cohesion and atomic structure. Proc. Am. Soc. Testing Materials 29, II: 7-64 (1929). Bibl. footnotes.

COKE

BERTELSMANN, WILHELM, and SCHUSTER, FRITZ. Kokerei. In Ullmann, Enzykl. tech. Chem., 2nd ed., 6: 671-707 (1930). Many bibliographies interspersed through text.

GREENWOOD, JOSEPHINE I. Coke—bibliography. Proc. Am. Gas Assoc. 1928: 1082-1085.

HOCK, H. Kokereiwesen. Technische Fortschrittsberichte. Dresden, Steinkopff, 1930. 172 p. Comprehensive bibl. as footnotes, with author and subject index.

JONES, J. H., KING, J. G., and SINNATT, F. S. The reactivity of coke. I. Standardized method for the determination of comparative values. Dept. Sci. Ind. Research, Fuel Research Board, Tech. Paper No. 18. 1927. 32 p. Bibl., p. 30-32.

PIETERS, H. A. J. Die Bildung von Stückkoks. Gas u. Wasserfach 75: 7 (1932). 70 references.

See also COAL: CARBONIZATION.

COLLOIDS

BANCROFT, WILDER D., and RUTZLER, J. E., JR. Colloid chemistry of the nervous system. J. Phys. Chem. 35: 3036-3057 (1931). 80 footnotes.

BECHHOLD, HEINRICH. Die Kolloide in Biologie und Medizin. 5. Aufl. Dresden, Steinkopff, 1929. 586 p. "Namen-Register nebst Quellenangaben," p. 508-562.

BEUNEE-NIEUWLAND, N. Agglutination van celsuspensies. Chem. Weekblad 27: 658-663 (1930). 60 footnotes.

CLAYTON, WM. Colloid chemistry. In Annual reports on the progress of chemistry 21: 259-287 (1924). 180

COLLOIDS—*Cont'd*

- footnotes. 22:281-332 (1925). 334 references.
- Colloids. *In* Tables Annuelles 6:1169-1204 (1928); 7:1398-1429 (1930). References through text.
- ETTISCH, GEORG. Die physikalische Chemie der kolloiden Systeme. *In* Handbuch der normalen und pathologischen Physiologie 1:91-227 (1927). Bibl. footnotes.
- FREUNDLICH, HERBERT. Structure and formation of colloidal particles. *Trans. Faraday Soc.* 23:614-623 (1927). 36 footnotes.
- FÜRTH, REINHOLD. Disperse Systeme und Brownsche Bewegung. *In* Auerbach and Hort, *Handb. physik. tech. Mechanik* 7:198-238 (1928). Bibl. footnotes.
- GÖBEL, WALTER. Einwirkung des Ultraviolettlichtes auf die Serumkolloide. *Biochem. Z.* 190:99-100 (1927). 36 references.
- GONELL, H. W., and KRATKY, O. Wachstums und Deformationstexturen organischer Stoffe. *In* Auerbach and Hort, *Handb. physik. tech. Mechanik* 4, pt. 2:286-318 (1931). Bibl. footnotes.
- HEYMANN, E. Stabilität und Herstellung kolloider Lösungen. *Kolloid-Z.* 48:195-206 (1929). 108 footnotes.
- KOPACZEWSKI, WLADISLAS. *Traité de biocolloidologie*. 2. ed. Paris, Gauthier-Villars, 1930. Contains bibls.
- KRAEMER, ELMER O. Colloids. *In* Taylor, *Treatise on Physical Chemistry*, 2nd ed., II:1567-1721 (1931). Bibl. footnotes.
- KRAEMER, ELMER O., and WILLIAMSON, ROBERT V. Internal friction and the structure of "solvated" colloids. *J. Rheology* 1:90-92 (1929). 82 references.
- KRUYT, H. R. Colloids, a textbook. New York, Wiley, 1930. 286 p. References at end of chapters.
- LIESGANG, RAPHAEL ED. *Metalle*. *Kolloid-Z.* 49:332-343 (1929). 120 footnotes.
- LINDAU, G., and SOELLNER, K. Fortschritte der Capillar- und Kolloidchemie seit 1923. *Z. angew. Chem.* 44:391-393, 541-549 (1931). 143 footnotes. Bibl., p. 548-549.
- MENEGHETTI, E. Chimismo, forma, funzione e fenomeni colloidali. *Biochim. terap. sper.* 15:95-98 (1928). 60 references.
- PAULI, W., and VALKE, E. *Elektrochemie der Kolloide*. Vienna, Springer, 1929. 647 p. Bibl. at end of each section.
- PAULI, W., and WEISS, E. Zur allgemeinen Chemie der Kolloid-Kolloidreaktionen. I. Versuche mit Farbstoffsolen und Eiweisskörpern. *Biochem. Z.* 203:103-141 (1928). 50 footnotes.
- RANDALL, MERLE, and CANN, JESSIE Y. Micelles and base exchange. *Chem. Reviews* 7:403-406 (1930). 85 references.
- REITSTOTTER, J. Kolloide. *In* Ullmann, *Enzyk. tech. Chem.*, 2nd ed., 6:708-728 (1930). Patent list, p. 714-716; patents on silicic acid gel, p. 722; bibl., p. 727-728.
- SOYENKOFF, BASIL C. Hydrocarbons as dispersion media. *J. Phys. Chem.* 35:3009-3010 (1931). 54 references.
- STAUDINGER, H. Organische Chemie und Kolloidchemie. *Kolloid-Z.* 53:19-32 (1930). 69 footnotes.
- STAUDINGER, M. Ueber die organischen Kolloide. *Ber. 62B*:2893-2909 (1929). 81 footnotes.
- SVEDBERG, THE. Darstellung und Behandlung kolloider Stoffe. *In* Stähler, *Handb. Arbeitsm. anorg. Chem.* 4:142-212 (1916). Bibl. footnotes.
- SVEDBERG, THE. Die Methoden zur Herstellung kolloider Lösungen anorganische Stoffe. 3. Aufl. Dresden, Steinkopf, 1922. 507 p. Reduction methods, p. 5-12. 161 references. Oxidation methods, p. 237, 252. 17 references. Hydrolysis methods, p. 253-255. 48 references. Other condensation methods, p. 283-287. 80 references. Mechano-chemical dispersion methods, p. 277-282. 105 references. Electrical dispersion methods, p. 413-415. 35 references. Classified references on p. 208-235, 280-281, 362-373, 406-411, 492-499.
- WÄCHTLER, MAXIMILLAN. Ueber die Doppelbrechungserscheinungen in Kolloiden. *Fortschritte Mineral., Krist. Petr.* 12:190-192 (1927). 91 references.
- WARE, JOHN C. The chemistry of the colloidal state. New York, Wiley, 1930. 313 p. Bibl. footnotes.
- WHITEHEAD, THOMAS H. Ion interchanges in aluminum oxychloride hydrosols. Thesis, Columbia Univ., 1930. 38 p. Bibl., p. 36-37.
- See also* ATMOSPHERE, BUTTER, CELLS, CELLULOSE, CEMENT, CEREBROSPINAL FLUID, CLAYS, COLLOID MILL, ELECTROOSMOSIS, EMULSIONS, FLOTATION, FLOUR, GLOBULIN, GLUE, GOLD: COLLOIDAL, GUMS, IRON: CHEMISTRY, IRON OXIDES, LATEX, LIPIDS, LUBRICATION, METALS, MOLASSES, ORGANIC CHEMISTRY, PETROLEUM, PROTEINS, PROTOPLASMA, RESINS, RUBBER, SOIL COLLOIDS, SPINAL FLUID, SULFUR, URINE.

COLLOID MILL *

CHWALA, A. Kolloidmühlen. Kolloid-Z. 52: 366-370; 53: 137-140, 266, 271 (1930); 54: 117-123, 243-251, 358-364; 55: 122-126, 251-254, 371-383; 56: 117-122 (1931). Patent review. Bibl. footnotes.

CHWALA, A. Zerkleinerungs-Chemie. Kolloidchem. Beihefte 31: 222-290 (1930). Bibl. footnotes.

COLOR SCALE *

RÖSCH, SIEGFRIED. Darstellung der Farbenlehre für die Zwecke des Mineralogen. Fortschritte Mineral., Krist. Petr. 13: 194-230 (1928).

COLOPHONY.* See RESINS (Burnett).**COLORIMETRY**

DAVIS, RAYMOND, and GIBSON, K. S. Filters for the reproduction of sunlight and daylight and the determination of color temperature. U. S. Bur. Standards, Misc. Publ. No. 114. 165 p. Bibl., p. 163-165.

MELLON, M. G., and FOSTER, VIOLET. Color of inorganic substances in organic and inorganic solvents. J. Phys. Chem. 34: 963-972 (1930). 54 references.

COLUMBIUM. See TANTALUM.**COMBUSTION**

JOACHIM, W. F. Combustion in high-speed oil engines. Trans. Am. Soc. Mech. Eng. 51: 99-113 (1929). 41 references, p. 108.

COMPRESSIBILITY

BRIDGMAN, P. W. Physics of high pressure. New York, Macmillan, 1931. 398 p. Bibl., p. 17-29 and at end of some chapters. Bibl. of Bridgman's work, p. 390-393. 73 references. Elasticity. Compressibility. In Tables Annuelles 7: 6-14 (1930); 8: 5-13 (1931). References through text.

CONCRETE

ABRAMS, DUFF A., and CLEVE, ALBERT. Bibliography on field control and tests of concrete. Proc. Am. Concrete Inst. 23: 637-641 (1927).

AMERICAN CONCRETE INSTITUTE. Committee E-3. Researches on concrete materials and on plain and reinforced concrete. Proc. Am. Concrete Inst. 22: 702-710 (1926); 23: 565-572 (1927); 24: 764-776 (1928); 25: 457-496 (1929).

ANDEREGG, F. O. Bibliography on weathering of concrete masonry units. Proc. Am. Soc. Testing Materials 31, pt. II: 822-824 (1931). 26 references.

Bibliography on deterioration of concrete. Proc. Am. Soc. Testing Ma-

terials 30, pt. I: 698-703 (1930). 66 references.

Blast furnace slag as concrete aggregate. J. Am. Concrete Inst. 2: 217-219 (1930). 60 references.

DAVEY, NORMAN. Construction joints in concrete; bonding new concrete to old. Gt. Britain, Dept. Sci. Ind. Research, Building Research Board, Special report No. 16. 1930. 74 p. Bibl., p. 70-72.

DAVIS, RAYMOND E. Summary of investigations of volume changes in cements, mortars and concretes produced by causes other than stress. Proc. Am. Soc. Testing Materials 30, pt. I: 683-685 (1930); J. Am. Concrete Inst. 1: 440-443 (1930). 56 references.

DAVIS, RAYMOND E., and DAVIS, HARMER E. Flow of concrete under the action of sustained loads. J. Am. Concrete Inst. 2: 900-901 (1931). 21 references.

DAVIS, RAYMOND E., and TRONELL, G. E. Properties of mass concrete. J. Am. Concrete Inst. 2: 418 (1931). 23 references.

GLANVILLE, W. H. The permeability of portland cement concrete. Dept. Sci. Ind. Research, Building Research Board, Tech. Paper No. 3. Revised. 1931. 62 p. Bibl., p. 57-62.

GONNERMAN, H. F., and WOODWORTH, P. M. Tests of retempered concrete. Proc. Am. Concrete Inst. 25: 376-379 (1929). 44 references.

KRIEGE, H. F. Determining the cement content of set concrete by chemical methods of analysis. Proc. Am. Soc. Testing Materials 31, pt. I: 392-398 (1931). 26 references with abstracts.

LEA, F. M., and BRADY, F. L. Slag, coke breeze and clinker as aggregates. Dept. Sci. Ind. Research, Building Research Board, Special Rept. No. 10. 1927. 22p. Bibl., p. 21-22. 29 references.

MCMILLAN, F. R. Bibliography on the weathering of concrete. Proc. Am. Soc. Testing Materials 31, pt. II: 814-821 (1931). 73 references.

MATTIMORE, H. S., and MILLER, H. H. Digest of available information on the use of calcium chloride for curing concrete. Proc. Am. Soc. Testing Materials 31, pt. I: 347-355 (1931). 17 references with abstracts.

MITCHELL, N. D., *et al.* Characteristics of concrete for fire resistance. Proc. Am. Concrete Inst. 25: 816-817 (1929).

PLATZMANN, C. R. Die Wasserdurchlässigkeit von Beton. Tonind.-Ztg. 54: 677, 720, 749 (1930). 48 references.

CONCRETE—Cont'd

POGGI, FERDINANO. Il cemento armato. Rome, Cremonese, 1928. 162 p. Bibl., p. 153-154.

PORTLAND CEMENT ASSOCIATION. Bibliography on mixing concrete. Proc. Am. Soc. Testing Materials 30, pt. 1: 598-629 (1930). 276 references, arranged chronologically and annotated.

RICHART, F. E., and ROY, N. H. Digest of test data on Poisson's ratio for concrete. Proc. Am. Soc. Testing Materials 30, pt. 1: 661-667 (1930). Annotated references.

RICHART, FRANK E. The failure of plain and spirally reinforced concrete in compression. Univ. of Ill., Eng. Expt. Sta., Bull. No. 190. 1929. 74 p. Bibl., p. 71-72.

SLOANE, ROSCOE C., *et al.* Effect of calcium chloride as an admixture in portland cement concrete. Ohio State Univ., Eng. Expt. Sta., Bull. 61. 1931. 61 p. Bibl., p. 60-61.

TELLER, L. W. Digest of tests in the United States for the determination of the modulus of elasticity of portland cement mortar and concrete. Proc. Am. Soc. Testing Materials 30, pt. 1: 635-660 (1930). 48 references. Full annotations.

WILLIAMS, G. M. Disintegration of concrete. J. Am. Concrete Inst. 1: 41-50 (1929). 29 footnotes.

See also CEMENT.

Serial

Journal of the American Concrete Institute. 1+. 1929+. Each issue contains an abstract section, consecutively paged.

CONDENSATION

MONRAD, C. C., and BADGER, W. L. The condensation of vapors. Trans. Am. Inst. Chem. Eng. 14: 115-116 (1930); Ind. Eng. Chem. 22: 1112 (1930). 53 references.

CONDUCTIVITY: Thermal. See THERMAL CONDUCTIVITY.

CONFECTIONERY

JORDAN, STROUD. Confectionery problems. Chicago, National Confectionery Assoc., 1930. 347 p. Bibl., p. 337-342.

CONTACT RECTIFIERS *

BERGSTEIN, MILTON. Classification of contact rectifiers. Trans. Am. Electrochem. Soc. 57: 419-426 (1930). 37 footnotes.

COPPER

HALFERDAHL, A. C. Reactions between iron sulfide, sulfur dioxide and iron

oxides in the metallurgy of copper. Ind. Eng. Chem. 22: 962-963 (1930). 41 references.

LEITMEIER, H. Kupfer. In Doelter, Handb. Mineralchem. 3, pt. 2: 8-106 (1926). Bibl. footnotes.

PRYTHERCH, W. E. Gases in copper and their removal. J. Iron Steel Inst. 43: 124 (1930). 25 references.

COPPER: Biochemistry *

KRAEMER, H. Use of copper in destroying typhoid organisms and the effects of copper on man. Am. J. Pharm. 77: 280-281 (1905).

COPPER: Ores

BUTLER, BERT S., *et al.* The copper deposits of Michigan. U. S. Geol. Survey, Prof. Paper 144. 1929. 238 p. Bibl., p. 3-14, 233.

COPPER ALLOYS

SCHIMMEL, ALFRED. Metallographie der technischen Kupferlegierungen. Berlin, Springer, 1930. 134 p. Bibl., p. 130-134.

COPPER SULFATE

DOELTER, C. Kupfersulfate. In Doelter, Handb. Mineralchem. 4, pt. 2: 265-323 (1929). Bibl. footnotes.

CORNSTALKS *

SWEENEY, O. R., and ARNOLD, LIONEL K. Cornstalks as an industrial raw material. Iowa State College, Bull. 98. 1930. 48 p. Bibl., p. 42-48. 75 references.

SWEENEY, O. R., and ARNOLD, LIONEL K. The production of paper from cornstalks. Iowa State College, Bull. 100. 1930. 78 p. Bibl., p. 70-78. 117 references.

CORROSION

BRADY, F. L. Corrosion of lead in building. Dept. Sci. Ind. Research, Building Research Board, Tech. Paper 8: 30 (1929). 23 references.

CAZAUD, R. La corrosion des métaux et alliages légers et ultra-légers. Rev. métal. 26: 376-377 (1929). 60 references.

CROWELL, J. K., and SCHULDIT, E. F. Bibliography of protective coatings and corrosion applying to gas mains and services. Proc. Am. Gas Assoc. 1928: 1461-1463. 102 references.

DRIESSEU, CL. G. Corrosion in gas technic. Het Gas 48: 271-280 (1928).

GREAVES, R. G., ABRAM, H. H., and REES, S. H. Erosion of guns. J. Iron Steel Inst. 119: 162-167 (1929). 48 references, annotated.

GUTHRIE, E. S., ROADHOUSE, C. L., and RICHARDSON, G. A. Corrosion of metals by milk and its relation to the

- oxidized flavors of milk. *Hilgardia* 5: 451-453 (1931). 35 references.
- HAAS, M. The corrosion of brass. *Korrosion u. Metallschutz* 5: 25-35 (1929); *Metals & Alloys* 1: 189 (1929). 26 references.
- IRWIN, H. J. Bibliography of corrosion in the pulp and paper industry. *Bull. Inst. Paper Chem.* 1, no. 7: 19-30 (1931).
- KENDALL, V. V., and SPELLER, F. N. Recent developments in corrosion prevention of ferrous metals. *Ind. Eng. Chem.* 23: 742 (1931). 28 references.
- KIRKPATRICK, SIDNEY D., *ed.* Process industries handbook of corrosion resistant materials. New York, Chemical & Metallurgical Engineering, 1931. 254 p. *Bibl.*, p. 173-174.
- KOSTING, PETER R., and HEINS, CONRAD, JR. Corrosion of metals by phosphoric acid. *Ind. Eng. Chem.* 23: 150 (1931). 50 references.
- KRÖHNKE, O., MAASS, E., and BECK, W. Die Korrosion unter Berücksichtigung des Materialschutzes. Leipzig, Hirzel, 1929. *Bibl.*, Vol. 1: 137-191.
- McKAY, R. J., FRASER, O. B. J., and SEARLE, H. E. Resistance of nickel and monel metal to corrosion by milk. *Am. Inst. Mining Met. Eng., Inst. Metals Div., Trans.* 1929: 199-201. 48 references.
- MANTELL, C. L. Corrosion of tin and its alloys. *Am. Inst. Mining Met. Eng., Inst. Metals Div., Trans.* 1929: 111-146. 100 footnotes.
- MASUKOWITZ, HANS. Beitrag zur Messingkorrosion. *Korrosion u. Metallschutz* 5: 226 (1929). 60 references.
- NORRIS, T. N., and BRYAN, J. M. The corrosion of the tin-plate container by food products. *Dept. Sci. Ind. Research, Food Investigation, Special Report No. 40.* 1931. 85 p. 73 references, p. 82-85.
- RABALD, ERICH. Werkstoffe. Physikalische Eigenschaften und Korrosion. I. Allgemeiner Teil. Metallische Werkstoffe. II. Nichtmetallische Werkstoffe. Leipzig, Spamer, 1931. Contains over 10,000 citations.
- SIEMENS, A. Cadmium als Korrosionsschutz. *Z. Electrochem.* 36: 104-105 (1930). 55 references.
- SUIDA, HERMANN, and SALVATERRA, HEINR. Rostschutz und Rostschutzanstrich. Vienna, Springer, 1931. 344 p. *Bibl.*, p. 302-333.
- WHITBY, L. Corrosion and protection of magnesium and magnesium alloys. *Ind. Chemist* 7: 206-208 (1931). 44 references.
- WHITE, A. E., and CLARK, C. L. Bibliography on deterioration of condensing equipment. *Am. Soc. Mech. Eng. Research Publ.* 1931. 55 p. *Bibl.*, p. 29-55. 500 references. *Chronological Abstracts*, p. 11-28.
- VON WULLEN SCHOTTEN, W. Korrosionsversuche mit Eisen. *Gas u. Wasserfach* 72: 456-458 (1929). 33 references.
- COTTON**
- LEDERLIN, P. Blanchiment, teinture, impression, apprêts. Paris, Baillière, 1923. 543 p. *Bibl. footnotes*.
- MULLIN, C. E., and McGEE, R. L. Immunized cotton. *Textile Colorist* 53: 85-87, 127, 460-463, 542-544 (1931); *Textile Recorder* 49, no. 578: 59; no. 579: 59-61 (1931). Literature and patent review.
- COTTONSEED ***
- STEECE, H. M. Annotated bibliography on the storage of cottonseed and of seed cotton. *Agr. J. India* 24: 127-134 (1929). 25 references.
- CRANBERRIES**
- MORSE, FRED W. A chemical study of cranberries. *Mass. Agr. Expt. Sta., Bull. No. 265.* 1930. *Bibl.*, p. 100-101.
- CREAM ***
- BABCOCK, C. J. Some factors affecting the viscosity of cream. *U. S. Dept. Agr., Tech. Bull. No. 249.* 1931. 20 p. *Bibl.*, p. 18-19.
- See also MILK.
- CREATININE**
- BEARD, HOWARD H., and BARNES, BRODA O. The influence of feeding proteins, amino acids and related substances upon creatine-creatinine metabolism. *J. Biol. Chem.* 94: 67-69 (1931). 51 references.
- COPE, C. L. Excretion of creatinine by the human kidney in health and in nephritis. *Quart. J. Med.* 24: 584-585 (1931). 45 references.
- PALLADIN, ALEX., and FERDMAN, D. Kreatinphosphorsäure. In *Abderhalden, Handb. biol. Arbeitsm.* 5, pt. 5A: 905-936 (1931). *Bibl. footnotes*.
- SHIVER, H. E. The physico-chemistry of creatine and creatinine. *Chem. Reviews* 6: 443-444 (1929). 69 references.
- See also BIOCHEMISTRY (Peters and Van Slyke).
- CRYOSCOPY ***
- ROBERTSON, CAMPBELL, and LA MER, VICTOR K. A critical study of precision cryoscopy. The freezing point depressions of potassium cobalticyan-

CRYOSCOPY *—*Cont'd*

ide and potassium ferricyanide. *J. Phys. Chem.* 35:1983-1984 (1931). 50 references.

See also MOLECULAR WEIGHTS, RUBBER (Staudinger).

CRYSTAL STRUCTURE

Bragg, W. L. Atomic arrangement in the silicates. *Trans. Faraday Soc.* 25: 291-314 (1929). 32 footnotes.

Bragg, W. L. Structure of silicates. *Z. Krist.* 74: 237-305 (1930). *Bibl.*, p. 304-305. 52 references.

Die allgemeine geometrische Strukturtheorie der Materie. *In* Auerbach and Hort, *Handb. physik. tech. Mechanik* 4, pt. 2: 248-271 (1931). Alphabetical *bibl.*

Ewald, P. P., and Hermann, C. *Strukturbericht*, 1913-1928. Leipzig, Akad. Verlagsges., 1931. 818 p. First issued as supplement to *Z. Krist.* References through text. Detailed abstracts of over 2,000 papers.

Goldschmidt, V. M. Crystal structure and X-ray research. *Ergebnisse tech. Röntgenkunde* 2: 151-182 (1931). *Bibl.* of most important work since 1928.

Hendricks, Sterling B. Crystal structures of organic compounds. *Chem. Reviews* 7: 476-477 (1930). 77 references.

Literatur betr. Krystallstrukturen. *Landolt-Börnstein-Roth, Tabellen*, 1st suppl., 414-416, 419-420 (1927). 200 references.

Lonsdale, Kathleen. X-ray evidence on the structure of the benzene nucleus. *Trans. Faraday Soc.* 25: 352-366 (1929). 56 footnotes.

Parker, Robert L. Die Kristallmorphologie im Licht neuerer analytischer Untersuchungen. *Fortschritte Mineral., Krist. Petrog.* 14: 139-142 (1930). 87 references.

Schiebold, E. Neuzeitliche Methoden der Kristallstrukturforschung. *In* *Ergebnisse tech. Röntgenkunde* II: 95-107 (1931).

Schleede, Arthur, and Schneider, Erich. Röntgenspektroskopie und Kristallspektroskopie und Kristallstrukturanalyse. Berlin, de Gruyter, 1929. 2 v. *Bibl.* with each chapter.

Structure of crystals by X-rays. *In* *Tables Annuelles* 7: 1503-1522 (1930). 159 references through text.

Wyckoff, R. W. G. The structure of crystals. 2nd ed. New York, Chem. Cat. Co., 1931. 497 p. *Bibl.* of crystal structure, 1912-1930, p. 397-475.

Zachariasen, William H. Untersuchungen über die Kristallstruktur von Sesquioxyden und Verbindungen

ABO. Norsk Videnskaps-Akademi i Oslo. *Skrifter. I. Matematisk-Naturvidenskabelig Klasse*, 1928, No. 4. 165 p. *Bibl.* footnotes.

See also ROENTGEN RAYS.

CRYSTALLOGRAPHY

Bernal, J. D., and Wooster, W. A. Crystallography. *In* *Annual reports on the progress of chemistry* 26: 275-307 (1929). 173 footnotes.

Crystallography and mineralogy. *In* *Tables Annuelles* 6: 1226-1278 (1928); 7: 1455-1502 (1930). References through text.

Steinmetz, H. *Fortschritte und Probleme der chemischen Kristallographie*. *Fortschritte Mineral., Krist. Petr.* 12: 218-219 (1927). 41 references.

CRYSTALS: Liquid. See LIQUID CRYSTALS.

CUMINIC ALDEHYDE

Cuminaldehyde. *In* Wagner, Die Aldehyde, 1929: 639-660. 100 footnotes.

CUPRENE *

Herzog, Walter. Ueber das Cupren (Carben). *Chem.-Ztg.* 55: 461-462, 478-479 (1931). 29 footnotes.

CURARE. See PHARMACEUTICALS (Munch).

CYANIDE PROCESS

Halferdaahl, A. C. The problem of treating cupriferous precious-metal ores by the cyanide process. *Eng. Mining J.* 128: 357 (1929). 88 references.

Raschig, F. P. Die Chemie der Cyanlaugung von Silbererzen. *Metall u. Erz* 25: 467-472, 525-529 (1928). 41 footnotes.

CYANIDES

Fleisher, N. A. Preparation of alkali metal cyanides from their carbonates, carbon and nitrogen. *Trans. State Inst. Appl. Chem. (Moscow)*, 1928, No. 10: 5-27. Includes patents.

Thompson, M. R. Purification and analysis of alkali cyanides. *Bur. Standards J. Research* 6: 1058-1059 (1931). 33 references.

CYSTEINE

Mahn, Herbert. Cystein. *In* *Abderhalden, Biochem. Handl.* 12: 557-570 (1930). *Bibl.* footnotes.

CYSTINE

Mahn, Herbert. Cystin. *In* *Abderhalden, Biochem. Handl.* 12: 570-596 (1930). *Bibl.* footnotes.

CYSTINURIA

Brand, Erwin, Harris, Myer M., and Biloon, Sol. Cystinuria. The excretion of a cystine complex which

decomposes in the urine with the liberation of free cystine. *J. Biol. Chem.* 86: 330-331 (1930). 44 references.

CYTOCHROME*

KEILIN, D. Cytochrome and respiratory enzymes. *Proc. Roy. Soc. 104B*: 206-252 (1929). 60 references.

DECOLORIZING AGENTS

SINGER, LEOPOLD. Anorganische und organische Entfärbungsmittel. Fortschrittsber. Chem.-Ztg. 1930: 98-108. 217 footnotes.

SINGER, LEOPOLD. Anorganische und organische Entfärbungsmittel. Dresden, Steinkopff, 1929. 259 p. Patents, classified by countries, p. 210-231. Bibl. footnotes.

DENSITY

BEIN, —. Spezifische Gewicht. Landolt-Börnstein-Roth, Tabellen, 1st suppl., 209, 211, 212, 217-218, 220 (1927); 2nd suppl., 270, 278-279, 283, 286, 294-296 (1931).

Density. *In* Tables Annuelles 7: 24-42 (1930); 8: 24-55 (1931). References through text.

DETERGENTS

MCGOWAN, ELLEN BEERS. A comparative study of detergents. New York, Teachers College, Columbia Univ., 1930. 125 p. Bibl., p. 123-125.

U. S. Bureau of Standards. Washing, cleaning and polishing materials. Circular No. 383. 1930. 47 p. Contains bibliographies.

See also DRY CLEANING, SOAP.

DEXTRIN

ZEMPLÉN, GÉZA. Dextrine. *In* Abderhalden, *Biochem. Handl.* 13: 88-99 (1931). Bibl. footnotes.

DIABETES

AUBERTIN, EMILE. Le rôle du foie dans la pathogénie du diabète. Les diabètes hépatiques. *Nutrition* 1: 60-62 (1931). 87 references.

DAUM, KATE. Special bibliography on diabetes mellitus. *J. Am. Dietetic Assoc.* 6: 142-145 (1930).

FREUND, IRWIN. Cholelithiasis and diabetes mellitus. *Arch. Verdauungs-Krankh.* 49: 314-315 (1931). 65 references.

GEELMUYDEN, H. CHR. Ueber einige Fragen und Aufgaben der Diabetesforschung nebst Richtlinien einer stoffwechsel-physiologischen Theorie des Diabetes mellitus. VIII. Ueber den intermediären Kohlenhydratstoffwechsel des Organismus. *Ergebnisse Physiol.* 30: 1-6 (1930).

GINSBERG, A. MORRIS. Hyperthyroidism and diabetes mellitus. *Endocrinology* 15: 232-233 (1931). 62 references.

GOTTSCHALK, ALFRED. Die Bedeutung der Ersatzkohlenhydrate für die Praxis und Theorie der Zuckerkrankheit. *Ergebnisse inneren Medizin u. Kinderheilkunde* 36: 56-60 (1929).

HORSTERS, HANS. Studien über den Diabetes mellitus des Menschen. *Z. ges. exptl. Med.* 66: 89-142 (1929). Bibl. footnotes.

MACLEOD, J. J. R. Der Brennstoff des Leber. *Ergebnisse Physiol.* 30: 408-411 (1930).

MEYER-BISCH, ROBERT. Mineral- und Wasserstoffwechsel bei Diabetes mellitus. *Ergebnisse inneren Medizin u. Kinderheilkunde* 32: 267-271 (1927).

PORGES, O., and ALDERSBERG, D. Die Behandlung der Zuckerkrankheit mit fettarmer Kost. *Wiener Arch. innere Medizin* 17: 191-198 (1929).

PUCHULU, FÉLIX. Diabetes latente. Buenos Aires, Talleres gráficos Ferarri hnos., 1929. 213 p. Bibl., p. 196-207. Publications of the author, p. 210-213.

RICHARDSON, H. B., SHORR, E., and LOEBEL, R. O. Tissue metabolism. II. The respiratory quotient of normal and diabetic tissue. *J. Biol. Chem.* 86: 569 (1930). 37 references.

ROOT, HOWARD F. Insulin resistance and bronze diabetes. *New England J. Med.* 201: 206 (1929). 59 references.

ROSENTHAL, F. Zur Kenntnis des "renalen" Diabetes. *Arch. Verdauungs-Krankh.* 42: 620-621 (1928). 65 references.

SHORR, E., LOEBEL, R. O., and RICHARDSON, H. B. Tissue metabolism. I. The nature of phlorhizin diabetes. *J. Biol. Chem.* 86: 548-549 (1930). 29 references.

WOLODIN, A. N. Ueber die Beziehungen zwischen der äusseren und inneren Sekretion des Pankreas bei Diabetes mellitus. *Arch. Verdauungs-Krankh.* 49: 198-200 (1931). 159 references.

See also INSULIN.

DIABETES INSIPIDUS*

MAINZER, FRITZ. Untersuchungen über die Bikarbonatausscheidung in Harn. II. Diabetes insipidus. *Deut. Arch. klin. Med.* 169: 27 (1931). 51 references.

DIALYSIS

SPIEGEL-ADOLF, MONA. Elektrodialyse. *In* Abderhalden, *Handb. biol. Arbeitsm.* 3, pt. B: 595-628 (1927). Bibl. footnotes.

DIASTASE

MALLOCH, J. G. Resistance of wheat starch to diastatic action. *Canadian J. Research* 1:144-147 (1929). 90 references.

WELZMULLER, FERDINAND. Die Abbaufähigkeit der Kuhmilchdiastase gegen verschiedene Stärkearten. *Biochem. Z.* 125:186 (1921). 32 references.

See also TAKADIASTASE.

DIATOMACEOUS EARTH

CALVERT, R. Diatomaceous earth. *New York, Chem. Cat. Co.*, 1930. 251 p. Several hundred footnotes.

CALVERT, R. Diatomaceous earth. *J. Chem. Education* 7: 2848-2849 (1930). 33 references.

HATMAKER, PAUL. Diatomite. *Bur. Mines, Information Circ.* 6391. 1931. 20 p. *Bibl.*, p. 19-20.

HUGILL, W. Structure and properties of diatoms in heat insulating materials. *Trans. Ceram. Soc.* 31:136-137 (1931).

IMPERIAL INSTITUTE. Mineral industry of the British Empire and foreign countries. Diatomaceous earth. *London, The Institute*, 1928. 55 pp. *Bibl.*, p. 51-55.

DIAZO COMPOUNDS

ANGELI, A. Ricerche e considerazioni sopra la struttura dei diazocomposti. *Gazz. chim. ital.* 60:352-380 (1930). 76 footnotes.

COHN, G. Diazotieren; Diazoverbindungen. *In* Ullmann, *Enzyk. tech. Chem.*, 2nd ed., 3:659-677 (1929). References through text.

DICHROISM *

SCHMIDT, W. J. Dichroitische Färbung tierischer und pflanzlicher Gewebe. *In* Abderhalden, *Handb. biol. Arbeitsm.* 5, pt. 2:1835-1924 (1931). *Bibl.*, p. 1922-1924.

DIELECTRICS

Dielectric constants. *In* *Tables Annuelles* 6:705-716 (1928); 7:947-965 (1930); 8:350-374 (1931). 156 references.

GYEMANT, A. Die elektrische Festigkeit flüssiger Isolierstoffe. *Physik. Z.* 30: 58 (1928). 50 references.

LIJFENDAHL, KRISTIAN. Studies of dipole moment. Thesis, Copenhagen, 1928. 160 p. *Bibl.*, p. 136-142. 210 references.

JAEGER, —. Dielektrizitätskonstanten. *Landolt-Börnstein-Roth, Tabellen*, 1st suppl., 573-574 (1927); 2nd suppl., 1012-1016 (1931).

MALTI, M. G. Bibliography of solid dielectrics. *Sibley J.* 43:243-249 (1929).

MURPHY, E. J., and LOWRY, H. H. The complex nature of dielectric absorption and dielectric loss, with particular reference to the influence of ions adsorbed on inner surfaces. *J. Phys. Chem.* 34: 598-620 (1930). 50 footnotes.

SMYTH, C. P. Properties of dielectrics. *J. Franklin Inst.* 207: 821-824 (1929). 41 references.

SMYTH, CHARLES F. Dielectric constant and molecular structure. *New York, Chem. Cat. Co.*, 1931. 214 p. *Bibl. footnotes. Bibl.*, p. 199-200, 205. 120 references.

Thermal resistivity of solid dielectrics. *J. Instn. Elec. Engr. (London)*. 68: 1355 (1930). 15 references.

DIET

BOAS, ISMAR. Diätetik der Magen- und Darmkrankheiten. 2. Aufl. Leipzig, Thieme, 1926. 242 p. Contains bibls.

HAWLEY, EDITH. A short method of calculating energy, protein, calcium, phosphorus and iron in the diet. *U. S. Dept. Agr., Tech. Bull.* No. 105. 1929. 20 p. *Bibl.*, p. 19-20.

KOEHN, MARTHA. Is fat a necessary constituent of the diet. *J. Am. Dietetic Assoc.* 7: 116-118 (1931). 33 references.

See also FOODS, METABOLISM, NUTRITION.

DIFFUSION

FURTH, REINHOLD. Diffusion ohne Scheidewände. *In* Auerbach and Hort, *Hand. physik. tech. Mechanik* 7: 701-704 (1930). 198 references.

See also DIALYSIS.

DIGESTION

HOLLANDER, FRANKLIN. What is the acidity of pure gastric juice? *J. Am. Inst. Homeopathy* 24: 500 (1931). 39 references.

IVY, A. C. The rôle of hormones in digestion. *Physiol. Rev.* 10:327-335 (1930). 354 references.

KRZYWANIEK, W. Die Verdauung des Schweines. *In* Mangold, *Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere*, II: 308-309 (1929). 48 references.

MAHLER, P. Beiträge zur Chemie des menschlichen Magensaftes. *Wiener Archiv innere Medizin* 19: 447-450 (1930). 110 references.

MANGOLD, ERNEST. Die Verdauung des Geflügels. *In* his *Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere*, II: 102-107 (1929). 246 references.

MANGOLD, ERNEST. Die Verdauung der Wiederkäuer. *In* his *Handbuch der*

Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, II: 232-237 (1929). 257 references.

SCHEUNERT, A., und KRZYWANIEK, W. Die Verdauung des Pferdes. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, II: 268-270 (1929). 64 references.

SCHEUNERT, A., and KRZYWANIEK, W. Verdauung. In Jahresber. Physiol. exptl. Pharmacol. 5: 216-233 (1924); 7: 353-396 (1926); 9: 309-360 (1928). Bibl. footnotes.

SCHIEBLICH, MARTIN. Die Mitwirkung der Bakterien bei der Verdauung. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, II: 390-392 (1929). 76 references.

VERZAR, F. Probleme und Ergebnisse auf dem Gebiete der Darmresorption. Ergebnisse Physiol. 32: 392-393 (1931).

WOKER, GERTRUD. Methoden zum Studium der Wirkung der einzelnen Verdauungssäfte. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 6: 1215-1706 (1928). Bibl. footnotes.

See also METABOLISM.

DIGITALIS. See PHARMACEUTICAL (Munch).

DIGITIN*

DUGUÉ, G. Étude sur la digitine. France, Office national des matières premières végétales pour la droguerie, la pharmacie, la distillerie et la parfumerie. Travaux. Notice no. 28. 1928. 42 p. Bibl. p. 39-42.

DIKETOPIPERAZINE

ROSSER, ERNST. Diketopiperazine. In Abderhalden, Biochem. Handl. 12: 994-1052 (1930). Numerous bibl. footnotes.

DILUTION, HEAT OF*

LANGE, E., and ROBINSON, A. L. The heats of dilution of strong electrolytes. Chem. Reviews 9: 115-116 (1931). 40 references.

See also THERMOCHEMISTRY.

DINITROPHENOL*

DESVERGNES, L. Le 2-4-dinitrophenol: Fabrication, propriétés et emplois. Chimie et industrie 26: 518-520 (1931). 164 references.

DIPHENYL

JENKINS, R. L., McCULLOUGH, R., and BOOTH, C. F. Syntheses in the diphenyl series. Ind. Eng. Chem. 22: 34 (1930). 26 references.

DISINFECTANTS

BANCROFT, WILDER D., and RICHTER, G. HOLMES. The chemistry of disinfection. J. Phys. Chem. 35: 511-530 (1931). 40 footnotes.

KLARMANN, ERNST. Recent developments in disinfectants. Soap 5, no. 5: 101-103, 113-119 (1930). 35 references.

SCHOELLER, WALTER, and HECK, ADOLF. Zur Theorie der Desinfektion. Biochem. Z. 140: 41 (1923). 26 references.

See also ANTISEPTICS.

DISSOCIATION

SCHINGNITZ, R. Die Dissoziation der starken Elektrolyte in nichwässriger Lösung. Z. Elektrochem. 36: 873-874 (1930). 54 references.

DISSOCIATION, HEAT OF*

SPONER, H. Optische Bestimmung der Dissoziationswärme von Gasen. Ergebnisse exakt. Naturwissenschaften 6: 102-103 (1927). 57 references.

See also THERMOCHEMISTRY.

DISSOCIATION CONSTANTS*

KOLTHOFF, —, and ROTH, —. Literaturverzeichnis zu sämtlichen Dissoziationskonstanten von Säuren, Basen und amphoteren Elektrolyten. Landolt-Börnstein-Roth, Tabellen, 2nd suppl., 1099-1101 (1931).

WOODWARD, LEONARD A. Untersuchung der elektrolytischen Dissoziation mittels Ramaneffektmessung. Physik. Z. 32: 792-793 (1931). 42 references.

DISTILLATION

RASSOW, B., and SCHULTZKY, H. Ueber ein allgemeines Prinzip der Kondensation. Z. angew. Chem. 44: 669-670 (1931). 29 footnotes.

ROBINSON, C. S. The elements of fractional distillation. 2nd. ed. New York, McGraw-Hill, 1930. 255 p. Bibl., p. 236-238. 137 references. Steam distillation tables, bibl., p. 246. 32 references.

DITHIONIC ACID

MELLOR, J. W. Dithionic acid and the dithionates. In his Inorg. Theor. Chem. 10: 582, 599-600 (1930).

DIURESIS

ENGEL, KARL, and EPSTEIN, T. Ueber Quecksilberdiurese. Ergebnisse inneren Medizin u. Kinderheilkunde 40: 187-196 (1931).

ISSAKOVA, ROSINA. Die neueren kolloidchemischen Betrachtungen über Diurese, sowie einige Untersuchungen über Serumviskosität. Folia Hematol. 31: 250-252 (1925). 70 references.

RAAB, W. Pituitrin und Wasserhaushalt bzw. Blutwasser und Diurese. Wiener Arch. innere Medizin 17: 511-512 (1929). 75 references.

DOLOMITE

SUFFEL, GEORGE G. Dolomites of Western Oklahoma. Okla. Geol. Survey, Bull. No. 49. 1930. 155 p. Bibl. references.

See also LIME AND LIMESTONE.

DRUGS

ALTPETER, J. Heilmittel der Chinolinreihe. I. 2-Phenylchinolin-4-karbonsäure und ihre Derivate. Pharm. Zentralhalle 70: 629-636 (1929). Literature and patent references through text.

BÜMMING, G., and FERREIN, K. Ueber die Prüfung von Arzneimitteln in neuerer Zeit. Arch. Pharm. 1929: 310-320. Bibl. through text.

HEGNER, ROBERT, SHAW, EDWIN H., JR., and MANWELL, REGINALD D. Methods and results of experiments on the effects of drugs on bird malaria. Am. J. Hyg. 8: 580-582 (1928). 33 references.

KESSER, E. Zur Kenntnis der Wirkungen undissoziierter Arzneimittel. Biochem. Z. 150: 520-521 (1924). 25 references.

See also PHARMACEUTICALS.

DRUGS: Analytical*

DAFERT, O. Die makrochemische Untersuchungen von Drogen. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 7C: 1361-1576 (1930). Bibl. footnotes.

LINDE, O., and TEUFER, H. Zur Gerbstoffbestimmung in Drogen. Pharm. Zentralhalle 70: 26, 59-60 (1929). 37 references.

MUNCII, JAMES C. Bioassay of capsi-cums and chillies. J. Am. Pharm. Assoc. 18: 1245-1246 (1929). 33 references.

See also PHARMACOLOGY (Munch).

DRY CLEANING*

HUBBARD, CLARENCE C. Drycleaning and redyeing handbook, including laboratory practice, formulas, tests and tables. Silver Spring, Md., 1929. 252 p. Bibl., p. 237-240.

HUBBARD, C. C. How to clean rugs and upholstery fabrics. New York, Rug Cleaners Inst. of Am., 1930. 364 p. Bibl., p. 30, 318-320.

See also DETERGENTS.

DUMORTIERITE*

NEVADA, UNIVERSITY OF. Mackay School of Mines. A bulletin of the Mackay School of Mines Staff on the mineral dumortierite. Univ. of Nevada Bull., XXII, No. 2. 1928. 47 p. Bibl., p. 45-47.

DUST EXPLOSIONS. *See* EXPLOSIONS.

DYES AND DYEING

AMBLER, JOSEPH A., *et al.* Chemistry and analysis of the permitted coal-tar food dyes. U. S. Dept. of Agr., Dept. Bull. No. 1390. 1928. 42 p. Bibl., p. 38-41. First supplement. 1930. Bibl., p. 7-8.

BLUMBERGER, J. S. PETRUS. Constitution der Azoleurstoffen. Chem. Weekblad 24: 2-12, 42-50 (1927). 75 footnotes.

BRIGHTMAN, R. Development of rayon dyestuffs. Ind. Chemist 7: 4 (1931). 77 patents.

COHN, G. Synthetische Farbstoffe. In Gräfers Handbuch der org. Warenkunde 5, pt. 2: 69-235 (1929). Patents through text.

CURTIS, CECIL A. Artificial organic pigments and their applications. London, Pitman, 1930. 291 p. Patents, p. 122-166.

CURTIS, C. A. Künstliche organische Pigmentfarben und ihre Anwendungsgebiete. Berlin, Springer, 1929. 230 p. Patent abstracts, p. 104-139; patent index, p. 223-225.

Diazotation et colorante azoïques. Tiba 8: 685, 813, 815, 931, 933, 1063, 1185 (1930). 175 references.

GRANDMOUGIN, E. Farberei. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 77-78 (1930). Books only.

GRANDMOUGIN, E. Künstliche Farbstoffe. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 113 (1930).

HURRY, J. B. The woad plant and its dye. London, Oxford Univ. Press, 1930. 328 p. Bibl., p. 295-298.

LANGE, OTTO. Die Schwefelfarbstoffe, ihre Herstellung und Verwendung. 2. Aufl. Leipzig, Spamer, 1925. Patent abstracts, p. 265-371. Bibl. footnotes.

Les colorants indigoides. Tiba 9: 377, 609 (1931). 55 references, mostly patents.

LIVET, F. Contribution à l'étude du rôle des électrolytes dans la teinture du coton par les colorants substantifs. Tiba 8: 273, 395, 397, 533 (1930). 74 references.

MACHEMER, HANS. Die Konstitution der Metallkomplexe indigoider Farbstoffe. J. prakt. Chem. 127: 159-162 (1930). About 300 references.

MAYER, F. Fortschritte der Farbstoffchemie. 1928. Fortschrittsber. Chem.-Ztg. 1929, No. 2: 41-61. 286 footnotes. 1929. 1930: 17-40. 306 footnotes. 1930. 1931: 69-93. 349 footnotes.

MAYER, FRITZ. Stickstofffreie nichtglycosidische Farbstoffe. In Meyer-Jacobson, Lehrbuch org. Chem. II, pt. V: 133-216 (1929). Bibl. footnotes.

MOUNIER, D. Contribution à l'étude de l'action de la lumière sur les colorants. *Tiba* 9:11, 127 (1931). 63 references.

MULLIN, C. E. Bibliography of patent literature on dispersal dyes. *Am. Dyestuff Rept.* 14:590-593 (1925).

SOCIETY OF CHEMICAL INDUSTRY. Colouring matters and dyes. *In* Reports on the progress of applied chemistry 14:104-132 (1929); 274 footnotes. 15:109-144 (1930); 310 footnotes.

THIESS, —. Fortschrittsbericht über das Gebiet der künstlichen organischen Farbstoffe seit 1926. *Z. angew. Chem.* 43:615-620 (1930). Patents through text.

ULLRICH, ARTHUR. Die Indanthrenfarbstoffe. *Metallbörse* 19:2693-2694, 2749-2750 (1929). Patent review.

WELTZIEN, W. Kunstseidenfärberei. *Kolloid-Z.* 52:110-116 (1930). 24 footnotes.

EDEMA

LABBE, MARCEL. L'équilibre hydrique de l'organisme les oedemes. *Ann. méd.* 28:124-125 (1930). 80 references.

LEBERMANN, F. Der Wasserversuch und seine klinische Bedeutung. Ergebnisse inneren Medizin u. Kinderheilkunde 38:356-371 (1930).

Oedema. *Index-Cat.*, S. G. O., 3rd ser., 8:385-392 (1929).

VANČURA, ANTONÍN. Účast mímoledivinových činitelů při vzniku ledvinového a srdečního oedemu. V Praze, Nákladem České akademie věd a umění, 1930. 63 p. *Bibl.*, p. 57-63.

WELLS, H. G. Edema. *In his* Chemical Pathology, 5th ed., 363-407 (1925). 259 footnotes.

EFFLORESCENCE

ANDEREGG, F. O., *et al.* Indiana limestone. I. Efflorescence and staining. *Purdue Univ., Univ. Expt. Sta., Bull.* 33. 1928. 82 p. *Bibl.*, p. 81-82. 38 references

EGGS

ALFEND, SAMUEL. Report on eggs and egg products. *J. Assoc. Official Agr. Chem.* 14:414-415 (1931). 42 references.

CALVERY, H. O. Study of the nitrogen distribution in the developing hen's egg by the modified Van Slyke procedure. *J. Biol. Chem.* 83:241 (1929). 34 references.

ROMANOFF, ALEXIS L. Biochemistry and biophysics of the developing hen's egg. I. Influence of humidity. *Cornell Univ. (N. Y.) Agr. Expt. Sta.,*

Mem. 132. 1930. 27 p. *Bibl.*, p. 25-27. 33 references.

RUNNSTRÖM, JOHN. Atmungsmechanismus und Entwicklungserregung bei dem Seeigellei. *Protoplasma* 10:170-173 (1930). 75 references.

ELASTICITY

SACHS, G. Elastizität und Festigkeit. *In* Landolt-Börnstein-Roth, Tabellen, 1st suppl., 32-34 (1927); 2nd suppl., 36-38 (1931).

ELECTRICAL CONDUCTIVITY

CHRÉTIEN, ANDRÉ. La conductibilité électrique des cristaux. *Rev. gén. sci.* 40:605 (1929). 28 references.

Electrical conductivity of electrolytes. *In* Tables Annuelles 6:1092-1134 (1928); 7:1335-1361 (1930). References through text.

EMELEUS, KARL GEORGE. The conduction of electricity through gases. *New York, Dutton*, 1930. 94 p. *Bibl.*, p. 89-91.

HARTLEY, H., *et al.* Electrical conductivity of solutions. *In* Annual reports on the progress of chemistry 27:326-356 (1930). 129 references, p. 354-356.

JANDER, WILHELM. Neuere Forschungen über Diffusion und elektrische Leitfähigkeit fester Salze. *Z. angew. Chem.* 42:466-467 (1929). 31 references.

MEISSNER, —. Elektrische Leitfähigkeit fester Stoffe. *In* Landolt-Börnstein-Roth, Tabellen, 1st suppl., 580-581 (1927); 2nd suppl., 1038-1041 (1931).

NEWMAN, F. H. Electrolytic conduction. *New York, Wiley*, 1931. 441 p. *Bibl.* footnotes.

PARTINGTON, J. R. Conductance, ionization and ionic equilibria. *In* Taylor, Treatise on Physical Chemistry, 2nd ed., I:607-729 (1931). *Bibl.* footnotes.

WALDEN, P. Elektrische Leitfähigkeit wässriger Lösungen. *In* Landolt-Börnstein-Roth, Tabellen, 1st suppl., 609-611 (1927); 2nd suppl., 1057-1059 (1931).

WALDEN, P. Elektrische Leitfähigkeit nichtwässriger Lösungen. *In* Landolt-Börnstein-Roth, Tabellen, 1st suppl., 646-647 (1927); 2nd suppl., 1076-1078 (1931).

WILLIAMS, JOHN WARREN, and FALKENHAGEN, HANS. The interior attraction theory of electrical conductance. *Chem. Reviews* 6:345 (1929). 23 references.

ELECTRICAL PRECIPITATION

STRONG, WM. W. Suspensoids and their electrical precipitation. *In* Alexander, Colloid Chemistry III:204-206 (1931). 77 references.

ELECTROCHEMISTRY

ALTPETER, J. Fortschritte in der Darstellung organischer Verbindungen auf elektrochemischen Wege in den Jahren 1925-1931. Metallbörse 21: 1515-1516, 1564-1565, 1611-1612, 1658 (1931). 141 footnotes.

BROCKMAN, CHARLES J. Principles of electrochemistry. New York, Van Nostrand, 1931. 348 p. Bibl. footnotes. Patents, p. 323-326.

DAVIES, CECIL W. The conductivity of solutions and the modern dissociation theory. New York, Wiley, 1930. 204 p. Bibl., p. 197-199. Bibl. footnotes.

DOMINIK, W. Advances in the electrochemical and electrometallurgical industries during 1926. *Przemysl Chem.* 12: 605-617 (1928).

GLASSTONE, S. Preparation of organic compounds by electrolytic methods. III. Electrolytic oxidation processes. *Ind. Chemist* 7: 139-142, 209-212 (1931). References through text.

GLASSTONE, S. The electrochemistry of solutions. London, Methuen, 1930. 476 p. Bibl. footnotes.

GRUBE, G. Grundzüge der theoretischen und angewandten Elektrochemie. 2. Aufl. Dresden, Steinkopff, 1930. 495 p. Bibl. p. 460-476. 825 references.

HARNED, HERBERT S. The electrochemistry of solutions. In *Taylor, Treatise on Physical Chemistry*, 2nd ed., 1: 731-852 (1931). Bibl. footnotes.

LANGMUIR, IRVING. Electrochemical interactions of tungsten, thorium, cesium and oxygen. New York, Columbia Univ. Press, 1930. 18 p. Bibl., p. 17-18.

MÜLLER, WOLF J., and KONOPICKY, KAMILLO. Ueber den motoelektrischen Effekt. *Monatsh.* 53-54: 720 (1929). 35 references.

ORTHMANN, W. Kritische Arbeiten zur elektrostatischen Theorie der starken Elektrolyte. *Ergebnisse exakt. Naturwissenschaften* 6: 198-200 (1927). 46 references.

SOCIETY OF CHEMICAL INDUSTRY. Electro-chemical and electro-metallurgical industries. In *Reports on the progress of applied chemistry* 14: 295-332 (1929); 250 footnotes. 15: 316-355 (1930); 257 footnotes.

See also COLLOIDS (Pauli).

ELECTRODES

NEWBERRY, E. Theory of electrodes. *Trans. Am. Electrochem. Soc.* 58: 187-210 (1930). 34 footnotes.

REIMERS, KARL. Ueber die Grenzen der Brauchbarkeit der Chinhydronelektrode bei der Untersuchung von Flüssigkeiten des menschlichen Körpers. *Z. ges. exptl. Med.* 67: 370-371 (1929). 41 references.

SCHUSCHARDT, G. Kohlenelektroden für elektrische Oefen, ihre Herstellung, Prüfung und Verwendung, nebst einer Uebersicht der deutschen Patente. Berlin, Seydel, 1929. 33 p.

ELECTROLYSIS

HALLA, F. Bemerkungen zur Elektrolyse mittels Wellenstrom. *Z. Elektrochem.* 35: 843-847 (1929). 300 references.

KREMAN, ROBERT K., and MÜLLER, ROB. Elektromotorische Kräfte, Elektrolyse und Polarisation. Part II. Elektrolyse und Polarisation. Leipzig, Akad. Verlagsges., 1931. 835 p. Bibl. footnotes.

SHIPLEY, J. W. The alternating current electrolysis of water. *Canadian J. Research* 1: 357-358 (1929). 36 references.

ELECTROLYTES

BJERRUM, NEILS. Neuere Anschauungen über Elektrolyte. *Ber.* 62B: 1091-1103 (1929). 34 footnotes.

BRÖNSTED, J. N. Activity of electrolytes. *Trans. Faraday Soc.* 23: 416-432 (1927). 68 footnotes.

FAJANS, K. Refractometric evidence for the existence of undissociated molecules and complex ions in solutions of strong electrolytes. *Trans. Faraday Soc.* 23: 357-375 (1927). 53 footnotes.

FALKENHAGEN, H. Interionic attraction theory of strong electrolytes. *Rev. Modern Physics* 3: 412-426 (1931). About 50 references.

MORGAN, O. M., and MAASS, O. Equilibrium existing in gas-water systems forming electrolytes. *Can. J. Research* 5: 198-199 (1931). 51 references.

ELECTROMETALLURGY

BILLITER, JEAN. Die neueren Fortschritte der technischen Electrolyse. Halle, Knapp, 1930. 328 p. Abundant patent and literature references.

ENGELHARDT, VICTOR, ed. Handbuch der technischen Elektrochemie. Vol. I. Die technische Elektrolyse wässriger Lösungen. A. Die technische Elektrometallurgie wässriger Lösungen. Leipzig, Akad. Verlagsges., 1931. 613 p. Detailed literature references.

KOTHNY, E. Bibliographie der Elektrometallurgie des technischen Eisen. Berlin, Ver. deut. Giessereifachleute, 1930. 66 p. Classified. Author index. Covers through 1928.

ELECTROMOTIVE FORCE

DRUCKER, —. Elektromotorische Kräfte galvanischer Ketten. In *Landolt-*

- Börnstein-Roth, Tabellen, 2nd suppl., 949-950 (1931).
- Electromotive forces. In *Tables Annales* 6: 1135-1168 (1928); 7: 1362-1397 (1930). References through text.
- KREMANN, R., and MÜLLER, ROB. Elektromotorische Kräfte, Elektrolyse und Polarisation. Part I. Leipzig, Akad. Verlagsges., 1930. 891 p. Bibl. footnotes.

ELECTRONICS

- COMPTON, KARL T., and LANGMUIR, IRVING. Electrical discharges in gases. *Rev. Modern Physics* 2: 123-242 (1930); 3: 191-257 (1931). 301 footnotes.
- CROWTHERS, JAMES A. Ions, electrons and ionizing radiations. 5th ed. New York, Longmans, 1929. 353 p. References at the end of most chapters.
- DEBYE, PETER. Dipolmoment und chemische Struktur. Leipzig, Hirzel, 1929. 134 p. Contains bibls.
- FROMHERZ, H. Dipolforschung und Stereochemie. *Z. Elektrochem.* 37: 277 (1931). 35 references.
- FUCHS, N. Die Regel von Antonow und die Molekelorientierung. *Kolloid-Z.* 52: 262-269 (1930). 37 footnotes.
- GRIMM, H. G. Allgemeines über die verschiedenen Bindungsarten. *Z. Elektrochem.* 34: 437 (1928). 32 references.
- HOAG, J. BARTON. Electron physics. New York, Van Nostrand, 1929. 208 p. Bibl. at end of chapters.
- KHARASCH, M. S., and REINMUTH, O. The electron in organic chemistry. *J. Chem. Education* 8: 1744-1748 (1931). 177 references.
- KOLLATH, R. Uebersicht über den Stand der Wirkungsquerschnitt Forschung. *Physik. Z.* 31: 1004-1005 (1930). 49 references.
- KRONIG, R. DE L., and FRISCH, S. Kernmomente. *Physik. Z.* 32: 471-472 (1931). 102 references.
- MARK, H., and WIERL, R. Die experimentellen und theoretischen Grundlagen der Elektronenbeugung. *Fortschritte Chem., Physik, physik. Chem.* 21, No. 4: 118-124 (1931). 202 references.
- MÜLLER, FRIEDRICH. Theorie und Methodik der Elektronenröhren-Potentiometer zur Messung elektromotorischer Kräfte. *Z. Elektrochem.* 36: 933-934 (1930).
- NORDHEIM, LOTHAR. Die Theorie der Elektronenemission der Metalle. *Physik. Z.* 30: 196 (1929). 33 references.
- RUDBERG, ERIK. Soft X-rays and secondary electrons; velocity measurements on the electron emission produced by soft X-rays and by electron impact. *Kungl. Svenska Vetenskapsakademiens Handlingar*, (3) 7, No. 1. 1929. 153 p. Bibl., p. 146-150.
- RUPP, E. Experimentelle Untersuchungen zur Elektronenbeugung. Ergebnisse exakt. Naturwissenschaften 9: 121-122 (1930). 71 references.
- SCHWARZENBACH, G. Ueber Protonen- und Elektronenaktivität in beliebigen Lösungsmitteln. *Helv. Chim. Acta* 13: 870-896 (1930). About 85 footnotes.
- SEELIGER, R. Die Wiedervereinigung von positiven Ionen mit freien Elektronen. *Physik. Z.* 30: 356-357 (1929). 75 references.
- SMYTH, H. D. Products and processes of ionization by low speed electrons. *Rev. Modern Physics* 3: 347-391 (1931). 65 footnotes.
- WERNER, OTTO. Ueber das elektrische Moment der Moleküle. *Z. angew. Chem.* 43: 663-669 (1930). 35 footnotes. Bibl., p. 669.
- WILLIAMS, JOHN W. Molekulare Dipolmomente und ihre Bedeutung für die chemische Forschung. *Fortschritte Chem., Physik, physik. Chem.* 20, No. 5. 1930. 56 p. Bibl. footnotes.

ELECTROOSMOSIS

- ARND, O. Ueber die Einfluss von Acetonitril auf die elektroosmotische Flüssigkeitsbewegung. *Biochem. Z.* 166: 423 (1925). 25 references.
- CURTIS, CARL E. The electrical dewatering of clay suspensions. *J. Am. Ceram. Soc.* 14: 257-262 (1931). 108 references. Schwerin's patents are also listed.
- PRAUSNITZ, P. H., and REITSTÖTTER, J. Elektrophorese, Elektroosmose und Elektrodialyse in Flüssigkeiten. Dresden, Steinkopff, 1931. 307 p. Bibl., p. 261-281; patents, p. 281-285.
- REITSTÖTTER, J. Elektroosmose. In *Ullmann, Enzyk. tech. Chem.*, 2. Aufl., 4: 401-411 (1929). Patent bibls., p. 403-405, 406, 407-409, 410, 411. Classified. Bibl., p. 411.

ELECTROPLATING

- AUDIETH, L. F., and NELSON, H. W. Electrodeposition of metals from non-aqueous solutions. *Chem. Reviews* 8: 351-352 (1931). 44 references.
- BLUM, WILLIAM, and HOGABOOM, GEORGE B. Principles of electroplating and electroforming (electrotyping). 2d ed. New York, McGraw-Hill, 1930. 424 p. Bibl. footnotes.

ELECTROPLATING—Cont'd

BRITTON, H. T. S. Importance of hydrogen ion concentrations in the electro-deposition of metals. *Ind. Chemist* 3: 314-318 (1927). Bibl. through text.

EGER, G. Galvanotechnik. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 476-519 (1930). Many references, especially patents, through text; German patents on chromium plating, p. 502-503.

EWING, D. T., ARCHER, J. E., and SHAD-
DUCK, H. Bibliography of electro-
deposition of nickel. *Mich. State*
Coll., Eng. Expt. Sta., Bull. No. 26.
1929. 87 p.

FREEMAN, BENJAMIN, and HOPPE, FRED-
ERICK G. Electroplating with chro-
mium, copper and nickel. New York,
Prentice-Hall, 1930. 212 p. Bibl., p.
203-206.

GARDAM, G. E. Survey of the published
information on chromium plating.
Elec. R. (London) 104: 717-718
(1929); *Chem. Age (London)* 20:
354-355 (1929); *Brass World* 25:
105-107 (1929); *Engineer (Metal-*
lurgist) 147: 75-76 (1929).

MACNAUGHTAN, D. J., and HOTHERSALL,
A. W. The causes and prevention of
pitting in electrodeposited nickel.
Trans. Faraday Soc. 24: 497-509
(1928). 31 references, p. 509.

ROSSMAN, JOSEPH. Electroplating with
cadmium. *Metal Ind. (N. Y.)* 27:
330-332, 375-376 (1929). Patent re-
view.

See also CHROMIUM PLATING, NICKEL.

EMBRYOLOGY

NEEDHAM, J. Chemical embryology.
New York, Macmillan, 1932. 3 vols.
2021 p. Contains bibls.

EMERALDS *

AITKENS, IRENE. Emeralds. U. S. Bur.
Mines, Information Circ. 6459. 1931.
18 p. Mimeographed. 27 footnotes.
Bibl., p. 17-18.

EMULSIONS

ALADIN, —. Technisch verwendbare
Emulsionen mit besonderer Berück-
sichtigung der bituminösen Emul-
sionen. Berlin, Allgem. Industrie-
Verlag, 1929. 314 p. Abstracts of 500
patents.

LANGE, OTTO. Technik der Emulsionen.
Berlin, Springer, 1929. 391 p. Bibl.
footnotes.

LANGTON, H. M. Emulsification in
chemical industry. *Ind. Chemist* 3:
457-461 (1927). 36 footnotes.

LOTTERMOSER, A., and CALANTAR, N.
Die technischen Zerstörungsmethoden
der Rohölemulsionen. *Kolloid-Z.* 48:
179-184 (1928). 63 footnotes.

RUTZLER, J. E., JR. Emulsions in theory
and practice. *Oil Fat Ind.* 7: 61-63
(1930). 33 references.

See also COLLOIDS, PHOTOGRAPHY.

ENAMELS

HALL, F. P. Influence of chemical com-
position on the physical properties of
glazes. *J. Am. Ceram. Soc.* 13: 198-
199 (1930). 42 references.

KRYNITSKY, A. I., and HARRISON, W. N.
Blistering phenomena in the enameling
of cast iron. *Bur. Standards J. Re-*
search 4: 806-807 (1930). 30 refer-
ences.

NEUMANN, BERNHARD. Die Salzglasur.
Sprechsaal 62: 872-874, 887-889
(1929). 48 footnotes.

SIMPSON, HAROLD E. The development
of an enamel on a eutectic basis. *J.*
Am. Ceram. Soc. 13: 79 (1930). 45
references.

STRUCKERT, LUDWIG. Die Emailfabrika-
tion. Berlin, Springer, 1929. 276 p.
Bibl., p. 260-269. 477 references.

See also CERAMICS, GLASS.

**ENDOCRINE SUBSTANCES. See HOR-
MONES.****ENZYMES**

ARTOM, CAMILLO. Sulla cataforesi degli
enzime del secreto pancreatico. *Arch.*
intern. pharmacodyn. therap. 38: 198-
199 (1930). 39 references.

BERGELL, PETER, and CARLS, HERBERT.
Fermente in der pharmazeutischen In-
dustrie. In Oppenheimer, Fermente
4, pt. 2: 144-245 (1929). Abstracts
of patents.

CHODAT, R. Fermente. In Ullmann,
Enzyk. tech. Chem., 2nd ed., 5: 169
(1930).

Fermente und Gärungschemie. In
Jahresber. Physiol. exptl. Pharmakol.
1: 788-803; 2: 528-544; 3: 1155-1174;
4: 642-666; 5: 1485-1515; 6: 715-743;
7: 1619-1650; 8: 498-520; 9: 1360-
1381; 10: 522-540 (1920-1929). A
most complete bibl.

FODOR, ANDOR. Das Fermentproblem
(zugleich Einführung in die Chemie
der Lebenserscheinungen). 2. Aufl.
Dresden, Steinkopff, 1929. 283 p.
Bibl. footnotes.

GERNGROSS, OTTO. Fermente in der
Lederindustrie. In Oppenheimer, Fer-
mente 4, pt. 2: 44-139 (1929). 217
footnotes.

GRASSMANN, WOLFGANG. Enzymchemie.
In Jahresber. Physiol. exptl. Pharma-
kol. 7: 266-307 (1926); 9: 214-232
(1928). Bibl. footnotes.

GRASSMANN, W., DYCKERHOFF, H., and
v. SCHOENEBECK, O. Ueber natürliche
Aktivatoren und Hemmungskörper
proteolytischer Enzyme. *Z. physiol.*

- Chem. 186:183-194 (1930). About 75 footnotes.
- HALDANE, J. B. S. *Enzymes*. London, Longmans, 1930. 235 p. Bibl., p. 195-224.
- HESSE, ALBERT. Fermente in der Nahrungsmittelindustrie. In Oppenheimer, Fermente, 4, pt. 2:298-366 (1929). 136 footnotes.
- HESSE, ALBERT. Fermente in der Textilindustrie. In Oppenheimer, Fermente, 4, pt. 2:259-297 (1929). 52 footnotes.
- JACOBY, MARTIN. Ueber Fermente. In Jahresber. Physiol. exptl. Pharmacol. 1:123-135 (1930); 3:156-167 (1922); 5:177-188 (1924). Bibl. footnotes.
- JOSEPHSON, KARL. α -Glucosidasen. In v. Euler, Chemie der Enzyme, II, pt. 1:107-136 (1928). Bibl. footnotes.
- JOSEPHSON, KARL. β -Glucosidasen. In v. Euler, Chemie der Enzyme, II, pt. 1:217-267 (1928). Bibl. footnotes.
- JOSEPHSON, KARL. Glucosido- β -glucosidasen. In v. Euler, Chemie der Enzyme, II, pt. 1:302-327 (1928). Bibl. footnotes.
- JOSEPHSON, KARL. Saccharasen. In v. Euler, Chemie der Enzyme, II, pt. 1:137-216 (1928). Bibl. footnotes.
- JOSEPHSON, KARL, and v. Euler, H. Amygdalinspaltung. In v. Euler, Chemie der Enzyme, II, pt. 1:268-301 (1928). Bibl. footnotes.
- KRAUT, HEINRICH. Methoden der Adsorption und Elution. In Oppenheimer, Fermente, 3:445-485 (1929). 51 footnotes; references in tables through text.
- MÜLLER, DETLEV. Fermentgewinnung aus niederen Kryptogamen ausser Hefen und Bakterien. In Oppenheimer, Fermente 3:486-512 (1929). 82 footnotes.
- NORD, FRIEDRICH F. Mechanism of enzyme action and associated cell phenomena. Baltimore, Williams and Wilkins, 1929. 78 p. Bibl., p. 72-78. 189 references.
- PRZYLECKI, ST. J. Le réversibilité des réactions enzymatiques. Ann. physiol. 3:554-556 (1927). 57 references.
- RONA, PETER. Die Fermente. In Handbuch der normalen und pathologischen Physiologie 1:68-90 (1927). Bibl. footnotes.
- RONA, PETER. Praktikum der physiologischen Chemie. Erster Teil. Fermentmethoden. 2. Aufl. Berlin, Springer, 1931. 420 p. Bibl. footnotes.
- SCHÄFFNER, A. Enzyme und ihre Bedeutung zur Konstitutionsermittlung von Naturstoffen. Fortschritte Chem., Physik, physik. Chem. 20, no. 7, 1930. 58 p. Bibl. footnotes.
- THUNBERG, T. Hydrogen-activating enzymes of the cells. Quart. Rev. Biol. 5:343-347 (1930). 165 references.
- WALDSCHMIDT-LEITZ, ERNST. Mode of action and differentiation of proteolytic enzymes. Physiol. Rev. 11:368-370 (1931). 75 references.
- WALDSCHMIDT-LEITZ, ERNST, *et al.* Ueber das proteolytische System in tierischen Organen. Z. physiol. Chem. 188:17-47 (1930). Bibl. footnotes.
- WELLS, H. G. Enzymes. In *his* Chemical Pathology, 5th ed., 37-90 (1925). 450 footnotes.
- WOKER, GERTRUD. Die Katalyse. Biologische Katalysatoren. Stuttgart, Enke, 1931. 592 p. Extensive bibl. footnotes.
- See also* FERMENTATION, PLACENTA, STOMACH.
- ### EPHEDRINE
- BENIGI, RENZO. Sull'azione farmacologica dell'efedrina. Archiv fisiol. 29:351-355 (1930). 133 references.
- CHEN, K. K., and SCHMIDT, CARL F. Ephedrine and related substances. Baltimore, Williams and Wilkins, 1930. 121 p. Bibl., p. 94-117. *Also in* Medicine 9:94-117 (1930).
- CHÉRAMY, P. L'éphédrine. J. pharm. chim. 10:279-280 (1929). 35 references.
- CHOPRA, R. N., KRISHNA, S., and GHOSE, T. P. Indian ephedras; their chemistry and pharmacology. Indian J. Med. Research 19:215-219 (1931).
- EMDE, HERMANN. Ephedrin. Arch. Pharm. 268:94-103 (1930).
- ### EQUATION OF STATE *
- BEATTIE, JAMES A., and IKEHARA, SHIKAO. A study of the methods of combination of the constants of the Beattie-Bridgeman equation of state. Proc. Am. Acad. Arts Sci. 64:175-176 (1930). 45 references.
- ### ERGOSTEROL: Irradiated *
- FABRE, R., and SIMONNET, H. Les stérols irradiés; propriétés, physiques, chimiques et biologiques. Ann. physiol. 4:565-569 (1928). 63 references.
- FABRE, R., and SIMONNET, H. L'irradiation des stérols; les rapports des stérols irradiés avec la vitamine antirachitique. J. pharm. chim. 8:504-506 (1928). 36 references.
- GHIRARDI, G. E. Sull'azione biologica dell'ergosterolo irradiato. Biochem. terap. sper. 16:253 (1929). 33 references.

ERGOSTEROL: Irradiated—Cont'd

GREENBAUM, F. R. Irradiated ergosterol, the modern antirachitic principle. *Am. J. Pharm.* 101: 417-425 (1929). 31 references.

Irradiated ergosterol and vitamin D. *J. Chemotherapy* 5: 135-136 (1928). 28 references.

PFANNENSTEIL, W. A summary of recent work on vigantol (irradiated ergosterol). *Lancet* 1928, II: 845-847.

TAYLOR, N. B., *et al.* Study of the action of irradiated ergosterol and its relationship to parathyroid function. *Can. Med. Assoc. J.* 25: 34-35 (1931). 124 references.

ERGOT

SMITH, MAURICE L. A quantitative colorimetric reaction for the ergot alkaloids and its application in the chemical standardization of ergot preparations. *Public Health Reports* 45: 1481 (1930). Reprint No. 1390: 15. 28 references.

THOMPSON, MARVIN R. The pharmacology of ergot. *J. Am. Pharm. Assoc.* 19: 718-720 (1930). 61 references.

ERGOTAMINE *

BOUCKAERT, J. J., and HEYMANS, C. β -Tétrahydronaphthylamine et ergotamine. *Arch. intern. pharmacodyn. therap.* 35: 151-152 (1929). 41 references.

ERYTHROCYTES *

JACOBS, M. H. Permeability of the erythrocytes. *Ergebnisse Biol.* 7: 48-55 (1931).

WINTROBE, MAXWELL M. Erythrocyte in man. *Medicine* 9: 245-255 (1930). 224 references.

ESCULIN *

GLASER, E., and KRAUS, M. Ueber die Synthese des Aesculins. *Biochem. Z.* 138: 191 (1923). 23 references.

ESSENTIAL OILS

BOURNOT, K. Fortschritte auf dem Gebiete der ätherischen Oele und der Terpene in den Jahren 1926, 1927, 1928. *Z. angew. Chem.* 43: 361-363, 383-388, 400-402 (1930). 134 footnotes. Books, p. 402. 16 references.

CHALLENGER, F. The investigation of essential oils. *Ind. Chemist* 4: 9 (1928). 32 references.

DELANGE, RAYMOND. Essences naturelles et parfums. Paris, Colin, 1930. 222 p. Bibl., p. 215-220.

Essential oils. *In Tables Annuelles* 6: 1341-1342 (1928); 7: 1592-1593 (1930). 184 references.

GERHARDT, O. Fortschritte auf dem Gebiete der ätherischen Oele und Riechstoffe. *Fortschrittsber. Chem.-Ztg.* 1931: 37-61. 411 footnotes.

GILDEMEISTER, E. Die ätherischen Oele. Miltz, Schimmel and Co., 3 vols. Vol. III, 1931. 1072 p.

KAUFMANN, H. P. Die bromometrische und rhodanometrische Bestimmung ätherischer Oele. *Arch. Pharm.* 1929: 1-27. 58 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Fine chemicals, medicinal substances and essential oils. *In Reports on the progress of applied chemistry* 14: 610-640 (1929); 102 footnotes. 15: 651-681 (1930); 99 footnotes.

TREFF, W., and FANTL, P. Bericht über die Fortschritte auf dem Gebiete der ätherischen Oele und Riechstoffe während des Jahres 1929. Metallbörse 20: 1013-1014, 1069-1070, 1125-1126, 1517-1518, 1573-1574, 1631-1632 (1930). 88 footnotes. 1930. 21: 747-748, 795-796, 843-844, 892-893 (1931). 223 footnotes.

ETHYL ALCOHOL

FOTH, GEORG. Handbuch der Spiritusfabrikation. Berlin, Parey, 1929. 1139 p. Numerous references.

See also FERMENTATION.

ETHYL ALCOHOL: Physiological.

BLUHM, AGNES. Zum Problem "Alkohol und Nachkommenschaft." München, Lehmann, 1930. 87 p. Bibl., p. 74-75.

BOEDLER, J. Aethanol. *Pharmakologie. In Houben, Fortschritte der Heilstoffchemie, Zweiter Abt., Bd. I:* 213-341 (1930). Bibl. footnotes.

FRETS, G. P. Alcohol and other germ poisons. Hague, Nijhoff, 1931. 179 p. Bibl., p. 151-174 (alcohol, p. 151-166).

ETHYL ETHER

PALKIN, S., and WATKINS, H. R. Purification and preservation of ether for anesthetic purposes. *Ind. Eng. Chem.* 21: 866-867 (1929). 25 references.

PFLUG, HANS. Diäthyläther. *Pharmakologie. In Houben, Fortschritte der Heilstoffchemie, Zweiter Abt., Bd. I:* 450-507 (1930). Bibl. footnotes.

ETHYLENE DICHLORIDE

BOZZA, G., and MAMOLI, L. Ricerche sulla cloridrina etilenica. *Giorn. chim. ind. appl.* 12: 283-292 (1930); 13: 163-173 (1931). 153 footnotes.

ETHYLENE GLYCOL

ULLRICH, A. Die Herstellung von Äthylenglykol, seiner Homologen und Derivaten an Hand der Patentliteratur. Metallbörse 19: 901-903, 957-958, 1013-1014 (1929). Patent review.

EXHAUST GASES*

LIESEGANG, W. Die Auspuffgase der Kraftwagenmotoren. *Gesundh. Ing.* 52: 391 (1929). 44 references.
See also CARBON MONOXIDE.

EXPANSION: Thermal. See THERMAL EXPANSION.**EXPLOSIONS: Dust***

GIBBS, W. F. Aerosols in industry. *Proc. Chem. Eng. Group, Soc. Chem. Ind.*, 6b-7: 184 (1924-1925).

RICE, GEORGE S., and GREENWALD, H. P. Coal-dust explosibility factors indicated by experimental mines investigations 1911 to 1929. *U. S. Bur. Mines, Tech. Paper* 464. 1929. 45 p. 25 bibl. footnotes. *Bibl.*, p. 43-45.

EXPLOSIONS: Gaseous.

BUNTE, K., and LITTERSCHEIDT, W. Die Entzündungsgeschwindigkeit von Gasgemischen. *Gas- u. Wasserfach* 73: 837-842, 871-878, 890-896 (1930). 39 footnotes.

CARR, MARVIN S., and BROWN, GEO. GRANGER. Gaseous explosions. VII. Effect of tetraethyl lead on rate of rise of pressure. *Ind. Eng. Chem.* 21: 1078 (1929). 45 references.

Combustion and detonation in gaseous mixtures. *In* *Tables Annuelles* 7: 1672-1698 (1930). References through text.

COOPER, C. M., and WIEZEVICH, P. J. Effects of temperature and pressure on the upper explosive limit of methane-oxygen mixtures. *Ind. Eng. Chem.* 21: 1214 (1929). 45 references.

COWARD, H. F., and JONES, G. W. Limits of inflammability of gases and vapors. *Bur. Mines, Bull.* 279. Revised ed. 1930. 114 p. *Bibl.*, p. 102-108. 159 references.

COWARD, H. F., and WHEELER, R. V. The ignition of firedamp. *Gt. Brit., Safety in mines research board, Paper No.* 53. 1929. 40 p. *Bibl. footnotes.*

LAFITTE, P. La physico-chimie du phénomène du "choc" et des "antidetonants." *J. chim. phys.* 26: 391-423 (1929). *Bibl. footnotes.*

RIMARSKI, *et al.* Ignition and propagation velocity in acetylene-oxygen mixtures. Striking back of the welding torch. *Jahresber. Chem. tech. Reichsanstalt* 8: 52-60 (1930).

EXPLOSIVES

BOUTON, CRAIG M., GRIFFIN, HARRY K., and GOLDEN, PAUL L. Accuracy of manometry of explosions. Comparative performance of some diaphragm-type explosion manometers when using hydrogen-air mixtures. *U. S. Bur. Mines, Tech. Paper* 496. 1931. 52 p. *Bibl.*, p. 49-52.

BRUNSWIG, HEINRICH. Das rauchlose Pulver. Berlin, Gruyter, 1926. 499 p. *Bibl.*, p. 479-489.

BRUNSWIG, H. Explosivstoffe. *In* *Ullmann, Enzyk. tech. Chem.*, 2d ed., 4: 792-793 (1929). Books only.

DESVERGNES, L. Le 1-3-5-trinitrobenzene ou benzite. *Chimie et industrie* 25: 3-17, 291-306 (1931). 156 footnotes; bibls., p. 17, 306.

DU PONT DE NEMOURS, E. I., and Co. *Blasters' handbook.* Wilmington, Du Pont, 1930. 238 p. *Bibl.*, p. 226-232.

PASCAL, PAUL. Explosifs, poudres, gaz de combats. 2. ed. Paris, Hermann, 1930. 320 p. Contains bibls.

RAUSCH, PETER. Hohlraumschiessen. *Z. ges. Schiess- u. Sprengstoffw.* 23: 124-125 (1928). 112 references.

SALMONI, R. Moderne vedute sulla detonazione nei motori a carburazione. *Giorn. chim. ind. appl.* 13: 12-19 (1931). 24 footnotes; *bibl.*, p. 18-19.

SOCIETY OF CHEMICAL INDUSTRY. Explosives. *In* *Reports on the progress of applied chemistry* 14: 668-695 (1929); 166 footnotes.

STETTbacher, ALFRED. Das Sprengstoffwesen in den Jahren 1924-1928. *Z. ges. Schiess-Sprengstoffw.* 24: 81-82, 129-135, 172-177, 219-223, 259-263, 300-302, 340-346, 383-388, 427-432, 478-484 (1929). 400 references.

EXTRACTORS*

BRANDEL, I. W., and KREMERS, EDWARD. Percolation. *Milwaukee, Pharmaceutical Rev. Pub. Co.*, 1908. 54 p. *Bibl.*, p. 11-48.

PRAUSNITZ, PAUL H. Laboratoriums-Apparat für die Extraktion von festen und flüssigen Stoffen, deren Entwicklung und Anwendung. *Arch. Pharm.* 268: 182-184 (1930). 84 references.

EYE

HECHT, SELIG. Physikalische Chemie und die Physiologie des Sehaktes. *Ergebnisse Physiol.* 32: 245-250 (1931). 215 references.

STEINDORFF, KURT. Chemie des Augapfels. *In* *Oppenheimer, Handb. Biochem.*, 2. Aufl., 4: 389-440 (1925). 321 footnotes.

FATS (Including oils and waxes).

BAUER, K. H. *Chemische Technologie der Fette und Öle.* Berlin, Parey, 1928. 423 p. *Bibl. footnotes.*

BAUER, K. H. Die Pflanzenfette. *In* *Gräbes Handbuch der org. Warenkunde* 3, pt. 2: 231-407 (1930). *Bibl. footnotes.*

FATS (Including oils and waxes)— Cont'd

- BERTRAM, S. H. De kwantitatieve bepaling der in water onoplosbare hoogere verzadigde vetturen in vetten en vetturen. *Chem. Weekblad* 24: 226-229 (1927). 60 footnotes.
- DAVIDSOHN, J. Die Bleichung der Oele, Fette, Wachse und Seifen. Berlin, Borntraeger, 1931. 269 p. Bibl. footnotes. Patents on p. 27-28, 60-61, 79, 102-104, 107-108, 112-117.
- DAVIDSOHN, J. Die Extraktion Oele und Fette nach patentierten Verfahren. *Chem. Umschau Fette, Oele, Wachse Harze* 38: 153-156, 205-207, 219-221 (1931). Patent review.
- DAVIDSOHN, J., and STADLINGER, H. Hilfsbuch für das Gebiet der Fette und Fettprodukte. Leipzig, Hirzel, 1930. 484 p. Bibl., p. 95-414.
- EICHWALD, EGON. Die tierischen Fette und Wachse. In Oppenheimer, Handb. Biochem., 2nd ed., 1: 73-108 (1924). 65 footnotes.
- Fats and waxes. In *Tables Annuelles* 6: 1353 (1928); 7: 1063 (1930). 90 references.
- GROSSFELD, J. Die Trennung der festen und flüssigen Fettsäuren und der Nachweis von gehärteten Fetten in Kakaofett. *Chem. Umschau Fette, Oele, Wachse Harze* 37: 3-13 (1930). 50 footnotes.
- GROSSFELD, J. Einige Fortschritte in der praktischen Speisefettuntersuchung. *Naturwissenschaften* 18: 337-343 (1930). 33 footnotes.
- GRÜN, ADOLF, and HALDEN, WILHELM. Analyse der Fette und Wachse. Vol. 2. Systematik - Analysenergebnisse. Bibliographie der natürlichen Fette und Wachse. Berlin, Springer, 1929. 800 p. Bibl., p. 588-770. Classified by source. Subject index covers references in bibl.
- HALDEN, WILH. Fette und Wachse. In Honcamp, Handb. Pflanzenernährung und Düngenlehre 1: 127-131 (1931).
- HARVEY, ELLERY H., and SCHUETTE, H. A. The sulfur monochloride reaction of fatty oils. *Ind. Eng. Chem., Anal. Ed.* 2: 44 (1930). 26 references.
- HEIDUSCHKA, A., and KIRSTEN, G. Beiträge zur Kenntnis des Rizinusöles und der Rizinolsäure. *Pharm. Zentralhalle* 71: 81-91 (1930). 67 footnotes.
- HERBIG, W. Jahresbericht auf dem Gebiete der Fette, Oele und Wacharten. 1923. *Z. deut. Oel-Fette-Ind.* 44: 527-529, 544, 557. 572-573. 582-583, 594-596, 606-607, 620-622, 632-633. 643-645, 655-657 (1924); 45: 2-3, 18-20, 43-44, 53-55, 67, 91-93, 107-108, 123, 136-138, 153-154 164-165, 192, 208, 219-220, 248-249, 264-266, 276-277, 290-291, 334, 347-348, 360-361, 374-375, 387-389, 402-403, 418-420, 430-432, 448-449, 479-480, 496-498, 510-512 (1925). 628 footnotes.
1924. 46: 18-21, 35-38, 53-54, 68-70, 99-100, 115-116, 132-133, 146-148, 165-166, 197, 209-210, 229, 244-245, 259-260, 274-275, 290-292, 325-326, 356-358, 371, 389-390, 403-404, 419-420, 434-436, 454-456, 485-486, 501-502, 521, 530-531, 547, 565-566, 580-581, 596-597, 660-661, 675-677, 691-694, 709, 711, 724-726, 740-742, 756-758, 770-772, 785-786, 802-804, 817-820 (1926). 596 footnotes.
- HOLDE, D., et al. Beitrag zu den sog. Ranziditätsreaktionen der Fette. *Allgem. Oel- u. Fett-Z.* 28: 1-7, 25-29 (1931). 36 footnotes.
- KAUFMANN, H. P. Ueber jodometrische Säuremessungen in der Fettanalyse. *Allgem. Oel- u. Fett-Z.* 28: 225-227, 248-250 (1931). 48 footnotes.
- LANGTON, H. M. Bleaching and deodorising of fatty oils. *Ind. Chemist* 4: 26-31 (1928). 22 references.
- MATTILL, H. A. Antioxidants and the autoxidation of fats. *J. Biol. Chem.* 90: 150-151 (1931). 42 references.
- MYDDLETON, W. W., and BARRY, J. H. Fats: Natural and synthetic. London, Benn, 1924. 182 p. Several hundred footnotes.
- OGG, WM. R., and JAMIESON, G. S. Interchangeability of oils and fats. U. S., 71st Congress, 2d session, Senate Doc. 82, 1930. 115 p. Bibl., p. 6-7. Condensed summary concerning interchangeability of oils and fats, in tabular form with authorities cited, p. 94-115.
- SOCIETY OF CHEMICAL INDUSTRY. Oils, fats, and waxes. In *Reports on the progress of applied chemistry* 14: 333-359 (1929); 111 footnotes. 15: 356-399 (1930); 317 footnotes.
- TÄUFFEL, K., et al. Zur Kenntnis des Traubenkernöls. *Allgem. Oel- u. Fett-Z.* 28: 119-126 (1931). 46 footnotes.
- VESELY, V. Sur la composition de la stéarine et de l'oléine industrielles. *Chimie et industrie* 22: 688 (1929). 29 references.
- WOLFF, HANS. Oele, Harze, Lacke. *Kolloid-Z.* 49: 210-217 (1929). 89 footnotes.

FATS: Physiological.

- KOEHN, MARTHA, and MENDEL, L. B. The utilization of fatty oils given parenterally. *J. Nutrition* 1: 442-443 (1929). 44 references.

- LEHMAN, F. Der Fettstoffwechsel. In Mangold, Handb. der Ernährung und Stoffwechsels der landwirtschaftlichen Nutztiere 3:209 (1931). 46 references.
- LEITES, SAMUEL. Studien über Fett- und Lipidstoffwechsel. I. Ueber alimentäre Lipämie. Die Beziehungen zwischen Neutralfett und Lipoiden in der Norm und bei Belastung mit Neutralfett bzw. Oleinsäure. Biochem. Z. 184:298-299 (1927). 45 references.
- LEITES, SAMUEL. Studien über Fett- und Lipidstoffwechsel. II. Ueber alimentäre Cholesterinämie. Biochem. Z. 184:309 (1927). 30 references.
- LEITES, SAMUEL. Studien über Fett- und Lipidstoffwechsel. IV. Ueber die Rolle des retikulo-endothelialen Systems in Fett- und Lipidstoffwechsel. Biochem. Z. 186:412 (1927). 45 references.
- RAAB, W. Zur Frage des Fettstoffwechsels in den peripheren Geweben. Wiener Archiv innere Medizin 17:468-470 (1929). 66 references.
- FATS: Sulfonated.***
- DEGROOTE, M., et al. Analysis of fatty modifications obtained by the action of sulfuric acid. Ind. Eng. Chem., Anal. Ed. 3:252 (1931). 45 references.
- MULLIN, C. E., and RAMSEUR, A. R. Sulfonated oils. Textile Colorist 53:589-592, 663-666 (1931). Patent review.
- FECES**
- KARTAGENER, M. Die Wasserstoffionkonzentration und die Pufferung der Faeces. Ergebnisse inneren Medizin u. Kinderheilkunde 40:262-267 (1931).
- FEEDINGSTUFFS**
- BECKER, RAYMOND B. A mineral deficiency in the rations of cattle. Thesis, Univ. Minn., 1925. 49 p. Bibl., p. 47-49.
- BRAHM, CARL. Fette. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:97-98 (1929). 40 references.
- BRAHM, CARL. Futtermittel aus der Oelindustrie. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:473-474 (1929). 56 references.
- V. FLACK, H. Zucht und Fütterung von Milchvieh. In Winkler, Handbuch der Milchwirtschaft 1, pt. 2:138-140 (1930).
- HALVERSON, J. O., and SHERWOOD, F. W. Investigation in the feeding of cottonseed meal to cattle. N. C. Agr. Expt. Sta., Tech. Bull. No. 39. 1930. 158 p. Bibl., p. 157-158. 46 references.
- HAYDUCK, FRITZ, and STAIGER, G. Futtermittel aus der Gärungsindustrie und Stärkefabrikation. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:435-436 (1929). 38 references.
- HENDERSON, H. O., and WEAKLEY, C. E. Effect of feeding different amounts of calcium and phosphorus upon the growth and development of dairy animals. West Va. Agr. Expt. Sta., Bull. No. 231:51-55 (1930).
- HONCAMP, FRANZ. Die pflanzlichen Futtermittel. A. Die natürlichen pflanzlichen Futtermittel. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:345-347 (1929). 220 references.
- KIRCH, W., and HILDERBRANDT, H. Die Silofuttermittelbereitung nach dem Kaltgärverfahren. Berlin, Parey, 1930. 216 p. Bibl., p. 209-214.
- LINTZEL, WOLFGANG. Die mineralischen Futtermittel. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:540-541 (1929). 46 references.
- LINTZEL, WOLFGANG. Mineralstoffe. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:220-222 (1929). 193 references.
- MANGOLD, E. Der Stärkewert und andere Futtereinheiten. In his Handb. der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere 3:475-477 (1931). 125 references.
- MANGOLD, ERNST. Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere als Grundlagen der Fütterungslehre. Berlin, Springer, 1929-1931. Includes bibliographies.
- MANGOLD, ERNST, and BRAHM, CARL. Die Futterkonservierung. I. Die Einsäuerung (Silage). In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:382-385 (1929). 170 references.
- MOHS, KARL. Futtermittel der Müllerei. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I:410-411 (1929). 49 references.
- SPENGLER, OSKAR. Futtermittel aus Rübenbau und Zuckerindustrie. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirt-

FEEDINGSTUFFS—Cont'd

schaftlichen Nutztier 1: 454 (1929). 28 references.

WINTER, ALDEN R. The nutritive value of blood-meal protein for growth. Ohio Agr. Expt. Sta., Bull. 436. 42 p. Bibl., p. 38-42.

FEEDINGSTUFFS: Analytical.

JONES, D. BREESE. Factors for converting percentage of nitrogen in foods and feeds into percentage of proteins. U. S. Dept. Agr., Circ. No. 183. 1931. 22 p. Bibl., p. 16-21.

FEHLING SOLUTION *

CATTELAINE, E. Histoire d'un réactif: La liqueur de Fehling. J. pharm. chim. 10: 405-413, 449-458 (1929). Bibl. footnotes; bibl., p. 455-458; 59 references.

FELDSPAR

BOWLES, OLIVER, and LEE, C. V. Feldspar. U. S. Bur. Mines, Infor. Circ. 6381. 21 p. Bibl., p. 19-21. 49 references.

STONE, RALPH W., and HUGHES, H. HERBERT. Feldspar in Pennsylvania. Pennsylvania Geol. Survey, Bull. M13. 1931. 63 p. Bibl. footnotes.

FERMENTATION

BARDERN, C. R., and FULMER, E. I. Chemical action of *Aerobacter faeni* on xylose and sucrose. Iowa State Coll. J. Sci. 5: 151-153 (1931).

BERNHAEUER, K. Zur Chemismus der oxydativen Gärung. Oest. Chem.-Ztg. 34: 164, 168-170 (1931). 107 references.

BLANCK, F. C. Fermentations in the food industries. Ind. Eng. Chem. 22: 1168 (1930). 35 references.

CHALLENGER, F. Some fermentative changes of technical interest. Ind. Chemist 6: 100 (1930). 40 references.

CHIRZASZCZ, T., and TIUKOW, D. Ueber die Säurebildung der Penicilliumarten (Link). Biochem. Z. 204: 106-124 (1929). 45 footnotes.

Fermente und Gärungschemie. In Jahresber. Physiol. exptl. Pharmacol. 1: 786-803; 2: 528-544; 3: 1155-1174; 4: 642-666; 5: 1485-1515; 6: 715-745; 7: 1619-1650; 8: 498-520; 9: 1360-1381; 10: 522-540 (1920-1929). Extensive bibl.

HERRICK, HORACE T., and MAY, ORVILLE E. Molds and chemical manufacture. Ind. Eng. Chem. 21: 620-621 (1929). 41 references.

HESSE, ALBERT. Enzymatische Technologie der Gärungsindustrien. In Oppenheimer, Fermente, 4, pt. 1: 1-350 (1929). 879 footnotes.

MARIAN, JOSEF. Die Assimilation der Glycerins durch sauerstoffgeschüt-

telte Hefe. Biochem. Z. 150: 290-303 (1924). 39 footnotes.

MOLINARI, EMIL. Ueber die biochemische Dismutation nebst Untersuchungen über die Essiggärung. Biochem. Z. 216: 187-215 (1929). Bibl. footnotes.

NEUBERG, CARL, and ARNSTEIN, BERNHARD. Vom Wesen der Buttersäure- und Butylalkoholgärung. Biochem. Z. 117: 269-314 (1921). 75 footnotes.

OWEN, W. L., and DENSON, W. P. Acceleration of alcoholic fermentation of cane molasses by the use of vegetable carbons and other inert substances. Centr. Bakt. Parasitenk., II Abt., 77: 523 (1929). 29 references.

PEDERSON, CARL S., and BREED, ROBERT S. The fermentation of glucose by organisms of the genus *Serratia*. J. Bact. 16: 183-185 (1928). 39 references.

RUDIGER, M. Branntwein, Industriesprit: Obst- und Beerenweine. In Gräfers Handbuch der org. Warenkunde 3, pt. 1: 89-176 (1929). Bibl. footnotes.

SCHOEN, M. Le rôle du phosphore dans le processus de fermentation. Bull. soc. chim. 11: 819-902 (1929). 157 footnotes.

SCHOEN, M. Les bases scientifiques de quelques nouvelles industries de fermentation. Chimie et industrie, Special No.: 96-110 (Mar., 1931). Bibl. footnotes.

SCHWEITZER, C. Les industries de la levure. Chimie et industrie 12: 623-637 (1924). 221 footnotes.

SMYTH, HENRY FIELD, and OBOLD, WALTER L. Industrial microbiology: the utilization of bacteria, yeasts and molds in industrial processes. Baltimore, Williams and Wilkins, 1930. 313 p. Acetic acid, p. 20-21; 32 references; citric acid and oxalic acid, p. 42-44; 59 references; lactic acid, p. 64-65; 29 references; butyl alcohol and acetone, p. 88-92; 89 references; xylose, p. 169-172; 62 references; amylase, p. 263-264; 30 references.

SOCIETY OF CHEMICAL INDUSTRY. The fermentation industries. In Reports on the progress of applied chemistry 14: 511-551 (1929); 144 footnotes. 15: 582-618 (1930); 94 footnotes.

ULLRICH, A. Die Herstellung von Butylalkohol und Aceton durch Gärung. Metallbörse 19: 5-6, 61-62, 229-230 (1929). Patent review.

WAGNER, F. Die chemisch-technische Fach- und Patent-Literatur über Presshefe und Gärungsalkohol, 1924-1930. Aussig, The Author, 1931. 256 p.

WETZEL, KARL. Die chemische Vorgänge beim biologischen Kohlen-

- hydratabbau. I. Die einleitenden Prozesse der biologischen Zuckerspaltung. *Ergebnisse Biol.* 7: 517-548 (1931). 802 references.
- WOKER, GERTRUD. Zymase. *In her Die Katalyse. Biologische Katalysatoren*, 1931, p. 1-200. Bibl. footnotes. Bibl., p. 155-163.
- WYNNE, A. M. Inhibition of the acetone-butyl alcohol fermentation by acids. *J. Bact.* 22: 235-237 (1931). 52 references.
- See also* ENZYMES, STARCH (Thaysen).
- ## FERTILIZERS
- BEAR, FIRMAN E. Theory and practice in the use of fertilizers. New York, Wiley, 1929. 348 p. Selected references at end of each chapter.
- COOPER, J. R. Study of the effect of commercial fertilizers on the performance of apple trees. *Ark. Agr. Expt. Sta., Bull.* 227. 1928. 61 p. Bibl., p. 54-61. 162 references.
- COOPER, J. R., and WIGGANS, C. B. Study of the effect of commercial fertilizers on the performance of peach trees. *Ark. Agr. Expt. Sta., Bull.* 239. 1929. 62 p. Bibl., p. 53-62. 184 references.
- EGNER, HANS. Radioaktiva "Gödselmedl." *Kungl. Landth. Akad. Handl. Tidskr.* 64: 760-762 (1925). 51 references.
- FISCHER, H., *et al.* Die Naturdünger. *In Honcamp, Handbuch der Pflanzenernährung und Düngerlehre*, II: 89, 115-116, 148-150, 161-162, 231-234, 273-274 (1931).
- FRAPS, G. S. Possibilities of sulphur as a soil amendment. *Texas Agr. Expt. Sta., Bull.* 414. 1930. 56 p. Bibl., p. 51-56. 87 references.
- FUDGE, J. FRANKLIN. The influence of various nitrogenous fertilizers on the availability of phosphate and potassium. *Alabama Polytechnic Institute, Agr. Expt. Sta., Bull.* 227. 49 p. Bibl., p. 47-49.
- GAARDER, T. Die Bindung der Phosphorsäure in Erdboden. *Medd. Vestlandets Forstl. Forsoksstat.* No. 14. 1930. 140 p. Bibl., p. 116-124.
- GUITTONNEAU, G., KEILLING, J., and BÉJAMBES, M. Les terres à prunier de l'Agenais et leurs besoins en éléments fertilisants. *Ann. sci. agron.* 46: 289-291 (1929). 57 references.
- HIBBARD, P. L. Chemical methods for estimating the availability of soil phosphates. *Soil Science* 31: 464-466 (1931). 31 references.
- HONCAMP, FRANZ. *Handbuch der Pflanzenernährung und Düngerlehre*. Berlin, Springer, 1931. Bibl. at end of chapters and sections.
- KLEBERGER, WILHELM. Grundzüge der Pflanzenernährungslehre und Düngerlehre. Teil II, Bd. 2. Die Düngerlehre. Hannover, Schaper, 1927. Bibl., p. 164-167, 112 references; p. 224, 19 references; p. 245-246, 55 references; p. 358-360, 86 references; p. 414-416, 65 references; p. 514-517, 100 references; p. 549-550, 44 references.
- KREYBIG, LUDVIG VON. Die Bedingungen der Wirtschaftlichkeit der Handelsdüngemittel. Berlin, Parey, 1930. 128 p. Bibl., p. 124-125.
- Kunstdünger. *In Honcamp, Handbuch der Pflanzenernährung und Düngerlehre* II: 275-665 (1931). Bibl. through text.
- LANHAM, W. B. Effect of potash fertilizer on the carrying qualities of tomatoes. *Texas Agr. Expt. Sta., Bull.* No. 357: 36-38 (1927).
- LOO, TSUNG-LÊ. Absorption of ammonia and nitrate by the roots of *Zea mays* seedlings in relation to the concentration and the actual acidity of culture solutions. *J. Faculty Agr. Hokkaido Imp. Univ.*, 30, pt. 1: 114-118 (1931). 103 references.
- McKIBBIN, R. R. The effect of sulfur on soils and crop yields. *Md. Agr. Expt. Sta., Bull.* 296. 1928. 114 p. Bibl., p. 109-113. 77 references.
- MATHER, THOMAS N. Effect of fertilizers upon the forms of phosphorus and the amounts of phosphorus, nitrogen and silica in hays. *Sci. Agr.* 10: 62-63 (1929). 50 references.
- MATTHEI, ADOLFO. Fertilizantes nitrogenados. Santiago, Imprenta universitaria, 1927. 80 p. Bibl., p. 5-9.
- MORGAN, M. F. Factors affecting the estimation of lime requirements from pH values. *Soil Science* 29: 178-180 (1930). 31 references.
- NIGHTINGALE, G. T., SCHERMERHORN, L. G., and ROBBINS, W. R. Some effects of potassium deficiency on the histological structure and nitrogenous and carbohydrate constituents of plants. *N. J. Agr. Expt. Sta., Bull.* 499. 36 p. 1930. Bibl., p. 34-36. 85 references.
- SAILER, RUDOLF. Der Einfluss verschiedenartiger Stallmistlagerung auf die Grösse der Lagerungsverluste und die Verwertung des Stallmistes durch die Pflanze unter besonderer Berücksichtigung der Heissvergärung des Stallmistes nach H. Krantz. *Landw. Vers.-Stat.* 111: 149-153 (1930).
- SCHUMAN, KARL. Die Phosphorsäure- und Kaliumaufnahme verschiedener Pflanzenarten aus lufttrockenen und erhitzten Boden mit verschiedener

FERTILIZERS—Cont'd

Azidität. Z. Pflanzenernähr., Düngung u. Bodenk. 15: 19, 94 (1929). 84 references.

SEIDLER, L. Künstliche Düngemittel. In Ullmann, Enzyk. tech. Chem., 2nd ed., 4: 24-91 (1929). German patents on phosphatic fertilizers, p. 60-64; bibl., p. 90-91.

SMITH, F. B., and BROWN, F. E. Nitrate assimilation in soils. Iowa Agr. Expt. Sta., Research Bull. No. 135: 59-63 (1931).

SMITH, NATHAN R., and HUMFIELD, HARRY. Effect of rye and vetch green manures on the microflora, nitrates and hydrogen ion concentration of two acid and neutralized soils. J. Agr. Research 41: 121-123 (1930). 42 references.

SOCIETY OF CHEMICAL INDUSTRY. Soils and fertilizers. In Reports of the progress of applied chemistry 14: 449-489 (1929). 151 footnotes. 16: 511-559 (1930). 185 footnotes.

STROBEL, A. Phosphorsäuredüngungsversuche mit Superphosphat, Thomas-mehl, Rhenaniaphosphat und Dikalzi-umphosphat auf vier verschiedenen Bodenarten. Landw. Jahrb. 59: 670-672 (1924).

TRUOG, E. J. Annotated bibliography of works on methods of applying fertilizer. In Reports and proceedings of the Joint Committee on Fertilizer Application, 1925-1928, p. 32-35. Washington, National Fertilizer Association, 1928.

WAESER, BRUNO. Fortschritte der Düngemittelindustrie im Jahre 1929. Metallbörse 20: 1237-1238, 1293-1294, 1349-1350 (1930). Bibl. through text.

WAESER, BRUNO. Pflanzenschädlingsbekämpfung und Düngung mit Schwefel. Metallbörse 18: 733-734, 845-846 (1928). 55 footnotes.

WICHERN, G. Fortschritte der Düngemittelindustrie (Phosphorsäure-Düngemittel in den Jahren 1925-1929). Fortschrittsber. Chem.-Ztg. 1930: 81-86. 30 footnotes.

WILHELMJ, ARTHUR. Ursachen der Wirkung des Thomasmehls. Z. Pflanzenernähr., Düngung u. Bodenk. 19A: 237-238 (1931). 62 references.

WILLIAMS, C. O. The fixation of phosphates in soils. Union South Africa, Dept. of Agr., Division of Chemistry Series No. 100: 426-438 (1929). 194 references.

See also LEATHER (Stadlinger).

FIBRIN

STARLINGER, WILHELM. Ueber die Methodik der quantitativen Bestim-

mung des Fibrinogens. Biochem. Z. 140: 229 (1923). 23 references.

FILTRATION

DUBSKÝ, J. V. Selbsttätig Filtrationsapparate. Leipzig, Thienie, 1931. 32 p. 70 references.

JANDER, G., and ZAKOWSKI, J. Membranfilter, Cella- und Ultrafeinfilter. Leipzig, Akad. Verlagsgesellschaft, 1929. 204 p. Contains numerous references to the literature.

PICKARD, JOSEPH A. Filtration and filters; an outline of the art. London, Benn, 1929. 488 p. Contains bibliographies.

PRAUSNITZ, PAUL H. Filtration im Laboratorium. Kolloid-Z. 50: 174-177 (1930). 120 references.

RABE, H. Filter und Filterpressen. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 358-372 (1930). Bibl., p. 372.

See also ULTRAFILTRATION.

FIREPROOFING

COHN, G. Flammenschutzmittel. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 387-400 (1930). Patents, p. 397-400; bibl., p. 400.

RAMSBOTTOM, J. E., and SNOAD, A. W. The fireproofing of fabrics. Second Report, Fabrics Coordinating Research Committee, 1930. Bibl., p. 71; patents, p. 72-93.

See also PAPER (Rossman).

FISH. See METABOLISM (Wunsch), SALMON.

FLAMES *

SCHAY, GÉZA. Hochverdünnte Flammen. Fortschritte Chem., Physik., physik. Chem. 21, no. 1. 1930. 68 p. Bibl. footnotes.

FLAX

BREDEMANN, G. Neue Flachs-Literatur. Faserforschung 8: 123-132 (1930).

KIND, W., et al. Der Flachs. Berlin, Springer, 1930. 427 p. Bibls. at end of 2nd, 3rd and 5th parts.

RISTENTPART, —. Flachs. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 381-387 (1930). Bibl., p. 387. References through text.

TOBLER, FR., Ed. Der Flachs als Faser- und Oelpflanze. Berlin, Springer, 1928. 273 p. 16 p. of bibl.

See also TEXTILES.

FLOTATION

BERL, ERNST, and SCHMITT, BERNHARD. Der Flotationprozess. In Auerbach and Hort, Handb. physik. tech. Mechanik 7: 615-634 (1930). Bibl. footnotes. Patents, p. 634.

LUYKEN, W., and BIERBRAUER, E. Die Flotation in Theorie und Praxis. Berlin, Springer, 1931. 284 p. Bibl., p. 251-264.

MAYER, E. W. Ueber Flotationschemikalien. *Chem.-Ztg.* 54: 229-230, 250-251 (1930). 28 footnotes.

MAYER, ERWIN W., and SCHRANZ, HUBERT. Flotation. Leipzig, Hirzel, 1931. 593 p. German patents, p. 522-527; bibl., p. 544-567. Author index.

PETERSEN, W. Differentielle Flotation. *Metallbörse* 19: 1769-1770, 1826-1828, 1882-1883, 1937-1938 (1929). 32 footnotes.

SEEROHM, H. C. Die Flotationsmittel. *Metall u. Erz* 25: 505-512 (1928). 38 footnotes.

WEINIG, ARTHUR J., and PALMER, IRVING A. The trend of flotation. *Colo. School of Mines Quarterly*, 24, no. 4, 1929. 146 p. Bibl., p. 136-146. Includes patents.

FLOUR

GORTNER, ROSS A. The colloid chemistry of wheat, wheat flour and wheat flour products. In *Alexander, Colloid Chemistry III*: 625-626 (1931). About 150 references.

LEVINE, V. E. Should whole wheat products displace the refined products. *Arch. Ped.* 46: 281-296 (1929). 52 references.

NEWTON, R., and COOK, W. H. The bound water of wheat-flour suspensions. *Can. J. Research* 3: 577-578 (1930). 31 references.

PASCOE, TRUMAN A. Study of the properties of wheat flour as produced by different milling systems. *Cereal Chem.* 7: 219-221 (1930).

See also BAKING.

FLUID METERS*

AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Fluid meters—their theory and application. Pt. 1. 3rd ed. 1931. 92 p. Bibl., p. 74-92.

FLUORESCENCE

LENARD, P., SCHMIDT, F., and TOMASHEK, R. Phosphoreszenz und Fluoreszenz. Leipzig, Akad. Verlagsges., 1928. 1544 p. Several hundred footnotes.

FLUORINE: Organic compounds.*

SCHIEHMANN, G. Die aromatischen Fluorverbindungen. *Chem.-Ztg.* 54: 269-270, 291 (1930). 60 footnotes.

FLUORITE*

DOELTER, C. Fluorit. In *his Handb. Mineralchem.* 4, pt. 3: 193-270 (1930). Bibl. footnotes.

FLUORSPAR

BASTIN, EDSON S. The fluorspar deposits of Hardin and Pope Counties, Illinois. Ill. State Geol. Survey, Bull. No. 58. 1931. 116 p. Bibl. footnotes.

CHERMETTE, ALEXIS. Le spath fluor dans le Massif Central; ses applications. *Autun*, 1927. 150 p. Bibl., p. 145-150.

JOHNSTON, WILLIAM DRUMM. Fluorspar in New Mexico. New Mexico, State Bur. of Mines and Mineral Resources, Bull. No. 4. 128 p. Bibl. footnotes.

STAUB, AUGUST WILHELM. Beiträge zur Kenntnis der Schwerspat- und Flusspatlagerstätten des Thüringer Waldes und des Richelsdorfer Gebirges. *Inaug.-Diss.*, Jena, 1928. 43-96 p. Bibl., p. 92-93.

FOODS

DIETZEL, R., and TÄUFEL, K. Die neuere Entwicklung der Lebensmittelchemie. *Z. angew. Chem.* 36: 201-205 (1923); 37: 158-164 (1924); 39: 413-421 (1926). Bibl. footnotes.

ELTERICH, T. O., BOYD, D. H., and NEFF, A. Use of gelatin as a supplemental food in the infant's dietary. *Arch. Pediatrics* 47: 319 (1930). 40 references.

GAUSS, HARRY. Clinical dietetics. St. Louis, Mosby, 1931. 490 p. Bibl. at end of each chapter.

GILLUM, LULU W. Modern food studies. Kansas City, Gillum Pub. Co., 1930. 319 p. Bibl., p. 312-314.

LEVINE, H., *et al.* Value of the oyster in nutritional anemia. *J. Nutrition* 4: 480-481 (1931). 43 references.

Literature of the medical profession and allied sciences concerning food. Indianapolis, Van Camp's Research and Control Laboratories, 1931. 31 p. Bibl. of 63 references, p. 25-27.

MCCANCE, ROBERT A. The carbohydrate content of foods. *Gt. Brit., Medical Research Council, Special Rept. No. 135.* 1929. 73 p. Bibl., p. 21-22, 68-73.

Nahrung und Ernährung. In *Jahresber. Physiol. exptl. Pharmacol.* 1: 546-554; 2: 204-232; 3: 804-835; 4: 237-276; 5: 1090-1124; 6: 315-347; 7: 1205-1240; 8: 177-207; 9: 1032-1066; 10: 170-209 (1920-1929). A very complete bibl. for these years.

SCHUKERS, C. F., *et al.* Sources of nutrients chosen by women during pregnancy, lactation and reproductive rest. *J. Am. Dietetic Assoc.* 7: 250-251 (1931). 36 references.

SOCIETY OF CHEMICAL INDUSTRY. Foods. In *Reports on the progress of applied chemistry* 14: 552-572 (1929); 223 footnotes. 15: 619-634 (1930); 143 footnotes.

STEINRUCK, A. Die Chemie der Lebensmittel im Jahre 1928. *Fortschrittsber. Chem.-Ztg.* 1929, No. 3: 69-86. 705 footnotes.

FOODS—Cont'd

STROHECKER, R. Neuere Untersuchungen auf dem Gebiete der Lebensmittelchemie. Arch. Pharm. 268: 329-349 (1930). 115 footnotes.

TÄUFEL, K. Die neuere Entwicklung der Lebensmittelchemie. Z. angew. Chem. 43: 145-149, 171-174, 195-199 (1930). 151 footnotes. 45: 8-13 (1932). 84 footnotes.

Serial

GT. BRITAIN. *Department of Scientific and Industrial Research. Food Investigation Board.* Index to the literature of food investigation. No. 1+. March, 1929+. Issued bi-annually. Compiled by Agnes Elisabeth Glenzie. Contains abstracts.

See also ENZYMES (Hesse), MEAT, METABOLISM, NUTRITION, REFRIGERATION, SALMON.

FOODS: Analytical.

PLÜCKER, WILHELM. Allgemeine Methoden zur Untersuchung der Nahrungs- und Genussmittel. In Abderhalden, Handb. biol. Arbeitern. 4, pt. 14: 1-1278 (1930). Bibl. footnotes.

WOODMAN, A. G. Food analysis; typical methods and the interpretation of results. 3rd ed. New York, McGraw-Hill, 1931. 557 p. References at end of each chapter.

FOOD: Disinfection.*

MARCHAL, PAUL, and VAYSSIÈRE, PAUL. Étude sur la désinfection des produits végétaux et des denrées agricoles. Min. Agr. (France), Ann. Éphyties 11: 180-183 (1925).

FOODS: Metals in.*

HODGES, MILDRED A., and PETERSON, W. H. Manganese, copper and iron content of serving portions of common foods. J. Am. Dietetic Assoc. 7: 14-16 (1931). 31 references.

MUNGER, STELLA, and PETERSON, W. H. The manganese content of raw and cooked vegetables. J. Home Economics 20: 199-200 (1928). 31 references.

PETERSON, W. H., and SKINNER, J. T. Distribution of manganese in foods. J. Nutrition 4: 426 (1931). 27 references.

FOOD: Preservation.

CHENOWETH, WALTER W. Food preservation. New York, Wiley, 1930. 344 p. References at end of most of the chapters.

RASMUSSEN, LORENZ B. Die Lebensmittel und ihre Aufbewahrung. Hannover, Schaper, 1931. 408 p. Bibl., p. 404-408.

STILES, WALTER. The preservation of food by freezing with special reference to fish and meat: A study in general physiology. Dept. Sci. Ind. Research, Food Investigation Board, Special Rept. No. 7. 1922. 186 p. Bibl. footnotes.

FOOD: Specific-dynamic action.*

GANTENBERG, ROBERT. Gaswechselbestimmung zur Untersuchung der klinischen Bedeutung der spezifisch-dynamischen Nahrungswirkung. Ergebnisse inneren Medizin 36: 326-330 (1929). 85 references.

LIEBESNY, PAUL. Die spezifisch-dynamische Eiweisswirkung. Biochem. Z. 144: 349-350 (1924). 51 references.

LUSK, G. Die Spezifischdynamische Wirkung der Nahrungsstoffe. Ergebnisse Physiol. 33: 103-105 (1931). 86 references.

LUSK, GRAHAM. Specific dynamic action. J. Nutrition 3: 529-530 (1931). 29 references.

MANSFELD, G., and HORN, Z. Ueber die sogenannte spezifisch-dynamische Wirkung der Nahrungstoffe. Biochem. Z. 208: 53-54 (1929). 30 references.

STRANG, J. M., and McCLUGAGE, H. B. Specific dynamic action of food in abnormal states of nutrition. Am. J. Med. Sci. 182: 80-81 (1931). 36 references.

TERRONE, EMILE F., and BONNET, R. Le mécanisme de l'action dynamique spécifique. Ann. physiol. physiochim. biol. 5: 292-294 (1929). 36 references.

FOOD ALLERGY*

ROWE, ALBERT H. Food allergy; its manifestations, diagnosis and treatment. Philadelphia, Lea and Febiger, 1931. 442 p. Bibl., p. 413-430.

FOOD POISONING

JORDAN, EDWIN O. Food poisoning. Porto Rico Rev. Pub. Health and Trop. Med. 4: 537 (1929). 31 references.

FORMALDEHYDE

BUGGE, G. Formaldehyd. In Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 413-426 (1930). Patents, p. 419-423; bibl., p. 426; bibl. footnotes.

VANINO, L., and SEITTER, E. Der Formaldehyd. 2. Aufl. Vienna, Hartleben, 1927. 330 p. German patents, p. 285-310.

FORMIC ACID

DIETZ, NICHOLAS. Potentiometric study of acid-base titration systems

in the very strongly acid solvent formic acid. Thesis, Columbia Univ., 1930. 35 p. Bibl., p. 33-35.

FRICITION *

FÜCHSEL, M. Ueber Verschleissbarkeit der Werkstoffe bei trockener Reibung. 1st Comm. New Intern. Assoc. Testing Materials, Group D: 104-112 (1930). Chronological, 1864-1929.

GRAETZ, LEO, and STÖCKL, KARL. Innere Reibung der Gase. In Auerbach and Hort, Handb. physik. tech. Mechanik 6: 262-309 (1928). Bibl. footnotes.

GRAETZ, LEO, and STÖCKL, KARL. Reibung im Flüssigkeiten. In Auerbach and Hort, Handb. physik. tech. Mechanik 5: 392-420 (1927). Bibl. footnotes.

FRUCTOSE

ZEMPLÉN, GÉZA. Fructose. In Abderhalden, Biochem. Handl. 13: 473-492 (1931). Numerous bibl. footnotes.

FRUITS

COPEMAN, P. R. v. D. R. Changes in the composition of oranges during ripening. Trans. Roy. Soc. S. Africa 19: 166-167 (1931). 40 references.

FUDGE, BONNIE R. Increasing the color of cranberries after removing from the vine. N. J. Agr. Expt. Sta., Bull. 504. 1930. 24 p. Bibl., p. 24. 26 references.

HARVEY, R. B. Artificial ripening of fruits and vegetables. Univ. of Minn. Agr. Expt. Sta., Bull. 247. 1928. 36 p. Bibl., p. 34-36; 46 references.

FUELS

BASORE, CLEBURNE A. Fuel briquettes from Southern pine sawdust. Thesis, Columbia Univ., 1929. 45 p. Bibl., p. 44-45.

BERTHELOT, CHARLES. Les combustibles dans l'industrie moderne. Paris, Bailière, 1928. 656 p. Bibl., p. 649-650.

DIETRICH, K. R., and JEGLENSKY, H. Die Untersuchungen der Alkoholkraftstoffen. Z. Spiritusind. 52: 138-140 (1929). 28 footnotes.

EVANS, E. C. Solid smokeless fuels: Their properties and uses. Proc. Chem. Eng. Group, Soc. Chem. Ind. 6b-7: 147-160 (1924-1925). 36 references.

HEINZE, RICHARD. Neuere Verfahren zur Veredlung von Brennstoffen. In Ergebnisse angew. physik. Chemie 1: 102-108 (1931). 259 references.

LE CHATELIER, HENRY L. Leçons sur le carbone, la combustion, les lois chimiques. Nouv. éd. Paris, Hermann, 1926. 456 p. Bibl., p. 445-450.

NEWELL, H. E., and SINNATT, F. S. The propagation of combustion in powdered coal. Gt. Britain, Safety

in Mines Research Board, Paper No. 63, 1930. 58 p. Bibl., p. 46-47.

SOCIETY OF CHEMICAL INDUSTRY. Fuel. In Reports on the progress of applied chemistry 14: 29-58 (1929); 268 footnotes. 15: 30-60 (1930); 178 footnotes.

THOMAS, C. E., and KEERINS, G. D. Discussion of the properties and economics of fuels used in Oregon. Oregon State Agr. Coll., Eng. Expt. Sta., Circ. Series No. 1: 41-43 (1929). 57 general references on fuels.

ZERBE, CARL. Die Druckhydrierung fester Brennstoffe. Chem.-Ztg. 55: 4, 18-19, 38-40, 94-96, 114-117, 136-137, 152-153 (1931). 67 footnotes; patent references through text.

See also COAL, GASOLINE, MOTOR FUEL, PEAT, PETROLEUM.

FUMARIC ACID

JACOBSON, KURT P. Ueber die biochemische Hydratisierung der Fumarsäure durch pflanzliche Zelle und Hefe. Biochem. Z. 234: 401-418 (1931). 50 footnotes.

FUMIGATION

BIDEAU, J. Hydrocyanic acid fumigation against insects and rats. Arch. Med. Pharm. Nav. 118: 352-389 (1928). "Very complete bibl."

STRAND, A. L. Comparison of the toxicity and the diffusion in a column of grain of chloropicrin, carbon disulfide and carbon tetrachloride. Minn. Agr. Expt. Sta., Tech. Bull. 49. 1927. 59 p. Bibl., p. 30-32. 43 references.

STRAND, A. L. Measuring the toxicity of insect fumigants. Ind. Eng. Chem., Anal. Ed. 2: 8 (1930). 25 references.

FUNGICIDES

CARUGHI, ACHILLE. I mezzi chimici nella lotta contro le malattie delle piante; fabbricazione—impiego—azione. Milano, Hoepli, 1928. 358 p. Bibl., p. 339-341.

Colloidal sulfurs and activated sulfurs. Intern. Rev. Agr., pt. I, 21: 270-272 (1930). 37 references.

DEUTSCHES REICH. Biologische Reichsanstalt für Land- und Forstwirtschaft. Bibliographie der Pflanzenschutzliteratur. Berlin, 1921 +. 1914-1919, 463 p. 1920, 71 p. 1921, 198 p. 1922, 162 p. 1923, 176 p. 1924, 226 p. 1925, 229 p. 1926, 231 p. 1927, 250 p. 1928, 251 p. 1929, 246 p. 1930, 245 p.

GRATZ, L. O. Effect of seed-potato treatment on yield and rhizoctonosis in Florida from 1924 to 1929. Fla. Agr. Expt. Sta., Bull. 220. 1930. 34 p. Bibl., p. 31-34. 92 references.

FUNGICIDES—Cont'd

HAMILTON, J. M. Studies of the fungicidal action of certain dusts and sprays in the control of apple scab. *Phytopathology* 21: 520-523 (1931).

HOLLAND, EDWARD B., DUNBAR, C. O., and GILLIGAN, G. M. Supplements for copper fungicides. *Mass. Agr. Expt. Sta., Bull. No. 252*. 1929. 94-112 p. Bibl., p. 108-112.

MARTIN, HUBERT. The scientific principles of plant protection. New York, Longmans, 1928. 316 p. Bibls. through chapters.

WHITZEL, H. H., and MCCLELLAN, S. E. A. Studies on fungicides. *Cornell Univ. (N. Y.) Agr. Expt. Sta., Mem. 128*. 1930. 79 p. Bibl., p. 7, 23-24, 75-79. 80 references.

WILCOXON, F., and MCCALLAN, S. E. A. Fungicidal action of sulphur. I. The alleged rôle of pentathionic acid. *Phytopathology* 20: 415-417 (1930). 57 references.

See also INSECTICIDES.

FURFURAL

BARRY, T. HADLEY. Furfural and its industrial applications. *Ind. Chemist* 6: 481 (1930). 35 references.

COHN, G. Furfural. *In Ullmann, Enzyk. tech. Chem.* 5: 442-447 (1930). Bibl., p. 447; references, including patents, through text.

α -Furfural. *In Wagner, Die Aldehyde*, 1929: 739-761. 164 footnotes.

FURS

SCHAEFER, A. Rauchwarenveredlung. *Chem.-Ztg.* 54: 297-298, 315-317 (1930). German patents through text.

VARNEY, EDITH. Furs and fur bearers of the United States and Canada, a list of books and articles on the technology and romance of the subject. St. Louis, Public Library, *Monthly Bull.* 27: 115-122 (1929). Also issued as a separate. 10 p.

FUSAIN *

DAVIS, J. D. Fusain. *Bur. Mines, Information Circ.* 6115. 1929. 10 p. Bibl., p. 9-10. 26 references. Also in *Mining Congress J.* 1929: 197-200.

See also COAL.

GALACTANS *

SCHMIDT, E., ATTERER, M., and SCHNEGG, H. Ueber die Abwesenheit von Galaktanen in den Skelettsubstanzen inkrustierter Zellwände. *Cellulosechemie* 10: 126-134 (1929). 70 footnotes.

GALACTOSE

ZEMPLÉN, GÉZA. Galactose. *In Abderhalden, Biochem. Handl.* 13: 458-471 (1931). Numerous bibl. footnotes.

GALLIUM

PETAR, ALICE V. Gallium, germanium, indium and scandium. *U. S. Bur. Mines, Information Circ.* 6401. 1930. 17 p. Bibl. p. 12-17.

PRIBRAM, RICHARD. Gallium. *In Doelter, Handb. Mineralchem.* 3, pt. 2: 532-536 (1926). 30 references.

GALVANIZING

BABLIK, H. Grundlagen der Verzinkens. Berlin, Springer, 1930. 255 p. Bibl., p. 252-255. 167 references.

EPSTEIN, SAMUEL, and DANILOFF, B. N. Selected bibliography on the embrittlement of structural steel in galvanizing. *Proc. Am. Soc. Testing Materials* 31, pt. I: 224-237 (1931). Arranged chronologically under subject headings.

GARBAGE

OSTROW, E. K. Selected bibliography on garbage and refuse disposal. New York, Municipal Administration Service, 1930. 9 pages. Covers magazine articles since 1926; also governmental research bureaus.

See also REFUSE DISPOSAL.

GAS LAWS

Gas laws. *In Tables Annuelles* 7: 274-293 (1930); 8: 293-311 (1931). References through text.

GAS MANTLES *

BERTELSMANN, W., and SCHUSTER, F. Gasglühkörper. *In Ullman, Enzyk. tech. Chem.*, 2nd ed., 5: 550-557 (1930). Patent lists through text.

GAS PLANT WASTES *

PARKER, A. Disposal of liquor effluents from gas-works. *Gas. J.* 179: 103 (1927). 45 references.

POWELL, A. R. Disposal of waste from gas plants. *Proc. Am. Gas Assoc.* 1929: 933. 25 references.

GASES: Asphyxiating and poisonous.

FLURY, FERDINAND. Gasvergiftung. *In Handbuch der normalen und pathologischen Physiologie* 2: 487-514 (1925). Bibl. footnotes.

FLURY, FERDINAND, and ZERNIK, FRANZ. Schädliche Gase, Dämpfe, Nebel, Rauch- und Staubarten. Berlin, Springer, 1931. 637 p. Contains bibls.

See also INDUSTRIAL POISONS.

GASES: Fuel.

BERG, TORSTEN. Svave i generatorgas. *Jernkontorets Annaler* 1930: 269-272. 74 references.

BERTELSMANN, W., and SCHUSTER, F. Kraftgas. *In Ullmann, Enzyk. tech. Chem.*, 2nd ed., 6: 786-809 (1930). References through text; gas pro-

- ducers, p. 803-804 (mostly German patents); German patents on purification of gas, p. 806.
- BERTELSMANN, W., and SCHUSTER, F. Leuchtgas. In Ullman, Enzyk. tech. Chem., 2nd ed., 7: 314-353 (1931). Patents: retorts and furnaces, 329-330; purification, 340-341; gas holders, 342-343; supply (pressure and pipe lines), 346-347; measurement, 348; analysis, 351; general, 352-353.
- Classified subject index of American Gas Association Carbonization Committee reports and related subject matter for the years 1903 to 1927, inclusive. Proc. Am. Gas Assoc. 1928: 1159-1163.
- FIELDNER, A. C. Utilization of off-peak water-gas equipment. Proc. Am. Gas Assoc. 1929: 816-822. Bibl. footnotes.
- FISCHER, FRANZ, and PICHLER, HELMUT. Ueber den Einfluss des Druckes auf einige Umsetzungen des Wassergases. Brennstoff-Chem. 12: 372 (1931). 55 references.
- HOLTZ, JOHN C. Origin and decomposition of organic sulfur compounds under gas-making conditions, with particular reference to the rôle of the carbon-sulfur complex. Johns Hopkins Univ., Thesis, 1930. 83 p. Bibl., p. 75-78.
- HOLTZ, JOHN C., and HUFF, WILBERT J. Résumé of recent literature on carbon disulfide with reference to the gas industry. Proc. Am. Gas Assoc. 1927: 1436-1439. 47 footnotes.
- HUFF, WILBERT J., and HOLTZ, JOHN C. The origin and decomposition of carbon disulfide in gas making. II. The carbon-sulfur complex. Proc. Am. Gas Assoc. 1927: 1431-1435. 34 footnotes.
- Industrial Gas. American Gas Association, Industrial Gas Section. Covers period Jan. 1, 1924, to Jan. 1, 1930. Supplementary material is to be published in A. G. A. Monthly.
- JILLSON, WILLARD R. Natural gas in Western Kentucky. Ky. Geol. Survey, 1931. 190 p. Bibl., p. 181-186.
- KEMPER, AUGUST. Gasfernversorgung. Halle, Knapp, 1930. 121 p. Bibl., p. 115-119.
- KÜSTER, HANS. Ueber Blausäure Bildung aus technischen Gasen. Brennstoff-Chem. 12: 334 (1931). 28 references.
- MERZGER, R., and PISTOR, F. Das Problem der Gastrocknung. Gas u. Wasserfach 73: 200 (1930). 31 references.
- Oil cracking for gas making. Proc. Am. Gas Assoc. 1930: 1388-1423. Annotated and classified.
- PHILFUELS Co. Current liquified petroleum-gas bibliography. Proc. Am. Gas Assoc. 1930: 1628-1629. 36 references.
- SINGER, L. Erdgas. In Ullmann, Enzyk. tech. Chem., 2d ed., 4: 481-495 (1929). Patents on the use of natural gas, p. 492; patents on gasoline from natural gas, p. 492. Bibl., p. 494-495.
- SOCIETY OF CHEMICAL INDUSTRY. Gas, carbonization, tar and tar products. In Reports on the progress of applied chemistry 14: 61-94 (1929); 124 footnotes. 15: 59-89 (1930); 223 footnotes.
- STANLEY, H. M. Recent advances in our knowledge of natural gas and "cracking" gas and their industrial utilization. J. Inst. Petroleum Tech. 15: 550-552 (1929). 76 references.
- ULMER, C. D. Books for the gas and coke-plant laboratory. Gas Age 64: 109-112 (1929); Proc. Am. Gas Assoc. 1929: 1094-1099. Lists and discusses 45 books.
- WESTMAN, A. E. R. Use of oxygen in the manufacture of producer gas. Can. Chem. Met. 14: 233 (1930). 22 references.
- GASES: Industrial.***
- BERTELSMANN, W., and SCHUSTER, F. Einführung in die technische Behandlung gasförmiger Stoffe. Berlin, Springer, 1930. 411 p. References at end of chapters.
- BRAUER, A., and REITSTÖTTER, J. Neuerungen auf dem Gebiete der anorganisch-chemischen Industrie, 1927-1930. I. Technische Gase. Z. angew. Chem. 44: 406-413 (1931). 147 footnotes.
- GEHLEN, H. Die Einwirkung elektrischer Entladung auf gasförmige Elemente und Verbindungen. Z. angew. Chem. 44: 30-34 (1931). 51 footnotes.
- LOEB, LEONARD B. The nature of a gas. New York, Wiley, 1931. 153 p. Bibl., p. 134-136. 88 references.
- MUHLERT, FRANZ, and DREWS, KURT. Technische Gase, ihre Herstellung und ihre Verwendung. Leipzig, Hirzel, 1928. 416 p. Bibl. footnotes. See also METHANE, etc.
- GASES: Mine. See MINE GASES.**
- GASES: Purification.***
- BAKES, W. E., KING, J. G., and SINNATT, F. S. The sulphur compounds in water-gas and their removal. Dept. Sci. Ind. Research, Fuel Research, Tech. Paper No. 31. 1931. 35 p. Bibl., p. 33-35. 69 references.
- BRÜCKNER, HORST. Die technischen Verfahren der Entschwefelung von Gasen. Gas u. Wasserfach 72: 442-445 (1929). Patents listed as footnotes.

GASES: Purification *—Cont'd

MILBOURNE, CHARLES G. The removal of hydrogen sulfide from gas by means of iron oxide with special reference to humidity conditions. Thesis, Johns Hopkins Univ., 1931. 89 p. Bibl., p. 82-87.

ROELEN, O. Ueber die Bestimmung, Umwandlung und Entfernung des organisch-gebunden Gasschwefels. Brennstoff-Chem. 12: 306, 312 (1931). 70 references.

SCHUSTER, FRITZ. Die Entstaubung und Entnebelung von Gasen. Kolloid-Z. 51: 286-288, 382-384 (1930). Patent review.

WAESER, BRUNO. Die Theorie der Gasentstaubung auf trockenen Wege. Metallbörse 18: 1573-1574 (1928). Bibl. through text.

GASES: Solubility.

Literatur über Gaslöslichkeit. In Landolt-Börnstein-Roth, Tabellen, 1st suppl., 309-315 (1927); 2nd suppl., 499-506 (1931).

GASES: Specific heat.

LOURIÉ, H. Chaleur spécifique des gaz. Chaleur et ind. 11: 432-435 (1930). 82 references.

See also SPECIFIC HEATS.

GASOLINE

BERL, E., and LIND, R. Das Kracken von Kohlenwasserstoffen. Petroleum 26: 1027-1042, 1057-1070 (1930). 47 footnotes.

FISCHER, F. Ueber die Entwicklung unserer Benzinsynthese aus Kohlenoxyd und Wasserstoff bei gewöhnlichen Druck. Brennstoff-Chem. 11: 489-490 (1930). 22 references, covering 1926-1930.

HOWES, D. A. Chemical examination of gasoline and light mineral oils. J. Inst. Petroleum Tech. 16: 85-88 (1930).

SPAUSTA, F. Kritische Betrachtung der gegenwärtigen Methoden zur Bestimmung der Kohlenwasserstoffklassen in Benzin. Petroleum 27: 769 (1931). 59 references.

WINKLER, J. Ueber Untersuchungsmethoden und chemische Zusammensetzung der Benzine aus polnischen Rohölen. Erdöl u. Teer 6: 162-164, 183-186, 197-198, 215-218 (1930). 73 footnotes.

See also HYDROCARBONS, PETROLEUM.

GELATIN

KISSLING, RICHARD. Fortschritte auf dem Gebiete der Industrie und Chemie des Leimes. Künstdünger u. Leim 27: 147-150 (1930). References through text.

KUNTZEL, A. Untersuchungen über die Quellung der Gelatine in wässerigen

Lösungen von Säuren, Basen und Salzen und deren Gemische. Biochem. Z. 209: 326-437 (1929). Bibl. footnotes.

REITSTÖTTER, J. Gelatine und Leim. In Ullmann, Enzyk. tech. Chem., 2d ed., 5: 577-603 (1930). German patents through text.

See also LEATHER (Stadlinger).

GELATINASE *

MERRILL, ALICE T., and CLARK, W. MANSFIELD. Some conditions affecting the production of gelatinase by *Proteus bacteria*. J. Bact. 15: 295-296 (1928). 22 references.

GEOCHEMISTRY

GOLDSCHMIDT, VICTOR MORITZ. Geochemische Verteilungsgesetze der Elemente. Videnskabs-Selskabet i Christiania. Skrifter. I. Mathematisk-Naturvidenskabelig Klasse, 1923, No. 3. 17 p. Bibl. footnotes.

HALLIMOND, A. F. Geochemistry. In Annual reports on the progress of chemistry 27: 283-304 (1930). 178 footnotes.

HERLINGER, E. Ueber die neuere Entwicklung der Geochemie. Fortschr. Min., Krist. Petr. 12: 241-242 (1927); Veröffentlicht. Kaiser Wilhelm Inst. Silikatforsch. 1: 335-336 (1928). 68 references.

STORZ, MAX. Die sekundäre authigene Kieselsäure in ihrer petrogenetisch-geologischen Bedeutung. I. Verwitterung und authigene Kieselsäure führende Gesteine. Berlin, Borntraeger, 1928. 137 p. Bibl. p. 135-137.

GERMANIUM

Germanium. Gmelins Handbuch der anorganischen Chemie. 8. Auflage, System-Nummer 45. 1931. 62 p. References through text.

See also GALLIUM.

GERMICIDES

MYERS, ROBERT PAGE. The germicidal properties of alkaline washing solutions, with special reference to the influence of hydroxyl-ion concentration, buffer index and osmotic pressure. J. Agr. Research 38: 562-563 (1929). 30 references.

GERMINATION

BURKE, T. W. L. Water absorption and germination with varieties of *Triticum vulgare* and *T. durum*. Sci. Agr. 10: 388 (1930). 33 references.

FRANCK, W. J., et al. Bibliography of "germination of seed." Wageningen, Intern. Seed Testing Assoc., 1928. xxviii + 214 p. Mimeographed. Includes effects of chemical factors.

JACOBI, GEORG. Untersuchungen über die Wirkung des ultravioletten Lichtes auf Keimung und Wachstum. *Beiträge Biol. Pflanzen* 16:462-464 (1928).

MACK, W. B. Relation of temperature and the partial pressure of oxygen to respiration and growth in germinating wheat. *Plant Physiol.* 5:65-68 (1930). 47 references.

PIRSCHLE, KARL. Acetaldehyd als Zwischenprodukt bei der Keimung fetthaltiger Samen. *Biochem. Z.* 169: 489 (1926). 27 references.

GLASS

BERGER, E. Gleichgewichtsverschiebungen im Glas und Einfluss der Wärmenvorgeschichte auf seine physikalischen Eigenschaften. *Glastech. Ber.* 8: 339-367 (1930). 79 footnotes.

DIMBLEY, V. Chemical analysis as applied to glasses and silicates and to raw materials for glass making. *Glass Rev.* 6: 207-216 (1930). 95 references.

EITEL, W., PIRANI, M., and SCHEEL, K. *Glastechnische Tabellen. Physikalische und chemische Konstanten der Gläser.* Berlin, Springer, 1932. 714 p. About 2500 references in tables through the book.

GEHLHOFF, G., KALSING, H., and THOMAS, M. Ueber die Läuterung des Glases. *Glastech. Ber.* 8: 1-24 (1930). 51 footnotes.

HALL, F. P. Influence of chemical composition on the physical properties of glazes. *J. Am. Ceram. Soc.* 13: 198-199 (1930). 42 references.

MYLIUS, W. Die Glasforschung im Jahre 1928. *Sprechsaal* 62: 677-680, 696-699 (1929). Annotated bibl.

REXER, ERNST. Kritische Untersuchung der Methoden zur Bestimmung der Angreisbarkeit von Gläsern. *Keram. Rundschau* 38: 387, 421, 464, 492, 506, 546, 560, 590, 624 (1930). 67 footnotes.

SCHULTZE, R. Färbung, Entfärbung und Läuterung durch Cer. *Glastech. Ber.* 8: 278-280 (1930).

SOCIETY OF CHEMICAL INDUSTRY. *Glass. In Reports on the progress of applied chemistry* 14: 209-226 (1929); 104 footnotes. 15: 235-244 (1930); 57 footnotes.

ZSCHACKE, FRITZ H. *Glas. Seine Herstellung und Verwendung.* Dresden, Steinkopff, 1930. 208 p. Hundreds of footnotes.

See also CERAMICS.

Serial

Glastechnische Berichte. 1+. 1923+. Contains abstracts and patents.

GLASS: Laminated.

WALSH, JAMES F. List of U. S. Patents pertaining to laminated glass. *Chem. Met. Eng.* 37: 421 (1930). 90 patents.

GLASS: Wire.

ROSSMAN, J. The manufacture of wire-glass as exemplified by patented inventions. *Glass Ind.* 10: 157-162, 189-192, 222-223, 243-245, 266-269 (1929). 119 patents.

GLASS SUBSTITUTES *

COBLENTZ, W. W. Recent developments of window materials and fabrics for transmitting ultra-violet radiation. *Glass Ind.* 10: 236 (1929). 29 references.

COBLENTZ, W. W., and STAIR, R. Data on ultra-violet solar radiation and the solarization of window materials. *Bur. Standards J. Research* 3: 687-689 (1929). 54 references.

GLAUCONITE. See GREENSAND.

GLIADIN

HAUGAARD, G., and JOHNSON, A. H. Fractionation of gliadin. *Compt. rend. trav. lab. Carlsberg* 18, no. 2, 1930. 138 p. *Bibl.*, p. 133-135.

GLOBIN *

BAUER, HUGO, and STRAUSS, EDUARD. Beiträge zur Kenntnis substituierter Proteine: Nitrierung und -Iodierung des Globins. *Biochem. Z.* 211: 190 (1929). 28 references.

GLOBULIN

EDSALL, JOHN T. Physical chemistry of muscle globulin. II. Some physicochemical properties of muscle globulin (myosin). *J. Biol. Chem.* 89: 312-313 (1930). 34 references.

VON MURALT, ALEXANDER L., and EDSALL, JOHN T. Physical chemistry of muscle globulin. III. Anisotropy of myosin and the angle of isocline. *J. Biol. Chem.* 89: 349-350 (1930). 38 references.

VON MURALT, ALEXANDER L., and EDSALL, JOHN T. Physical chemistry of muscle globulin. IV. Anisotropy of myosin and double refraction of flow. *J. Biol. Chem.* 89: 386 (1930). 33 references.

SPIEGEL-ADOLF, MONA. *Die Globuline.* Dresden, Steinkopff, 1930. 452 p. *Bibl.* footnotes.

GLUCOSE

DEKKER, K. D. Bijdrage tot de Kennis der glucoseontleding. *Arch. Suikerind. Ned. Ind., Mededeelingen* 39: 723-802 (1931). 58 footnotes.

GLUCOSE—Cont'd

ZEMPLÉN, GÉZA. Glucose. *In* Abderhalden, *Biochem. Handl.* 13: 315-442 (1931). Numerous bibl. footnotes.
See also CARBOHYDRATES.

GLUCOSIDES

ARMSTRONG, E. F., and ARMSTRONG, K. F. The glucosides. New York, Longmans, 1931. 123 p. Bibl., p. 111-119; classified.

EMSCHWILLER, GUY. La synthèse photochimique des glucides. *Bull. soc. chim.* 49: 1167-1187 (1931). 46 footnotes.

VAN RIJN, J. J. L. Chemische Monographie der Pflanzenglykoside. 2. Aufl. Berlin, Borntraeger, 1931. 620 p. Bibl. footnotes.

ZEMPLÉN, GÉZA. Glykoside. *In* Abderhalden, *Biochem. Handl.* 13: 855-1053 (1931). Numerous bibl. footnotes.

GLUE

GOEBEL, E. Ueber Leim und Gelatine. *Farben-Ztg.* 35: 867-869, 921-923, 1019-1022 (1930). 36 footnotes.

GURIAN, D. Die technische Herstellung von Leim und Gelatine. *Kolloid-Z.* 54: 106-112, 239-243 (1931). Patents through text.

KISSLING, R. Fortschritte auf dem Gebiete der Chemie und Industrie des Leimes und der Gelatine. *Fortschrittsber. Chem.-Ztg.* 1929: 96-99. 137 footnotes.

KISSLING, R. Fortschritte und neue Erfahrungen auf dem Gebiete der Leimindustrie im Jahre 1928. *Chem. Umschau Fette, Oele, Wachse Harze* 36: 268-271 (1929). 72 references. 1929. 37: 145-147. 83 references; patents through text. 1930. 38: 247-249 (1931). 105 references.

TRUAX, THOMAS R. The gluing of wood. U. S. Dept. Agr., Dept. Bull. No. 1500. 1929. 78 p. Bibl., p. 75-77. 54 references.

GLUTAMIC ACID

MAHN, HERBERT. Glutaminsäure. *In* Abderhalden, *Biochem. Handl.* 12: 486-506 (1930). Bibl. footnotes.

GLUTATHIONE

BISCEGLIE, V. Il glutathione. *Biochem. terap. sper.* 16: 144-146 (1929). 66 references.

FIRKET, J., and COMHAIRE, —. Recherches expérimentales sur la teneur en glutathion des pois au début de la germination. *Bull. acad. roy. méd. Belg.* 9: 121-122 (1929). 26 references.

GHERZI, R. A. C. Oscilaciones del tenor en glutatión reducido en algunos procesos tóxicos e infecciosos. *Anales*

asoc. química Argentina 19: 196-197 (1931). 44 references.

JOYET-LAVERGNE, PH. Glutathion et chondriome. *Protoplasma* 6: 110-112 (1929). 54 references.

GLYCEMIA *

HIRSCH, GERTRUD. Ueber den Einfluss der Alkalizufuhr auf die alimentäre Glykämie im Hungerzustand. *Biochem. Z.* 189: 459 (1927). 31 references.

OPPEL, W. W. Zur Charakteristik der alimentären glykämischen Kurve. *Biochem. Z.* 205: 46, 62 (1929). 61 references.

ROST, G. A. Glykaemia in ihren Beziehungen zu Dermatosen. *Arch. farm. sper.* 48: 76-79 (1930).

GLYCEROL

DARKE, W. F. Glycerin and its substitutes in industry. *Proc. Chem. Eng. Group, Soc. Chem. Ind.*, 10: 113 (1928). 132 references; classified.

SCHLENKER, ERNST. Das Glycerin. Stuttgart, Wiss. Verlagsges., 1932. About 275 p. German patents on production of glycerol by fermentation, p. 166-168; on artificial plastics from glycerol, p. 223-225.

ULLRICH, A. Die Gewinnung des Glycerins durch Gärung. *Metallbörse* 19: 509-510, 621-622 (1929); *Ind. chimica* 5: 292-295 (1930). Patents though text.

GLYCOCOLL

MAHN, HERBERT. Glykokoll. *In* Abderhalden, *Biochem. Handl.* 12: 305-367 (1931). Numerous bibl. footnotes.

GLYCOGEN

SAHYUN, MELVILLE, and LUCK, JAMES M. The influence of epinephrine and insulin on the distribution of glycogen in rabbits. *J. Biol. Chem.* 85: 19-20 (1929). 60 references.

ZEMPLÉN, GÉZA. Glykogen. *In* Abderhalden, *Biochem. Handl.* 13: 230-249 (1931). Bibl. footnotes.

GLYCOLYSIS

BARER, A. P. Study of glycolysis. *J. Clinical Investigation* 10: 518-520 (1931). 44 references.

ELIAS, H., and SAMMARTINO, U. Die Beziehungen von Säure und Alkali zur Adrenalinglykosurie. *Biochem. Z.* 117: 10-40 (1921). 75 footnotes.

LOHMANN, KARL. Chemische Bestimmung der Glykolyse und der Resynthese der Kohlenhydrate. *In* Oppenheimer, *Fermente* 3: 1236-1278 (1929). 105 footnotes.

MAURIAC, PIERRE. Glycolyse et glycoregulation sanguine. *Nutrition* 1: 41-42 (1931). 49 references.

OHLE, H. Die Chemie der Monosaccharide und der Glykolyse. Ergebnisse Physiol. 33: 558-701 (1931). Bibl. footnotes.

GOLD

BORDEAUX, ALBERT. L'or et l'argent. Paris, Baillière, 1926. 597 p. Bibl., p. 6-7.

KLEMENC, A. Die Goldanalyse. In Doelter, Handb. Mineralchem. 3, pt. 2: 172-185 (1926). Bibl. footnotes.

LEAVER, EDMUND S., and WOOLF, JESSE A. Retreatment of mother lode (California) carbonaceous slime tailings. U. S. Bur. Mines, Tech. Paper 481. 1930. 20 p. Bibl., p. 19-20.

LEITMEIER, H. Gold. In Doelter, Handb. Mineralchem. 3, pt. 2: 186-282 (1926). Bibl. footnotes.

GOLD: Biology.*

JOEL, E. Das kolloide Gold in Biologie und Medizin; die Goldsolreaktion im Liquor Cerebrospinalis. Leipzig, Akad. Verlagsges., 1925. 115 p. Bibl., p. 107-113. Bibl. footnotes.

GOLD: Colloidal.*

V. WEIMARN, P. P. Einige Versuchsergebnisse über die Dispersoidsynthese von Gold mittels alkalischer Formaldehydlösungen. Kolloid-Z. 53: 352-370 (1930). 70 footnotes.

GOUT *

STEINITZ, H. Calcinosis circumscripta ("Kalkgicht") und calcinosis universalis. Ergebnisse inneren Medizin u. Kinderheilkunde 39: 216-223 (1931).

WELLS, H. G. Uric acid metabolism and gout. In his Chemical Pathology, 5th ed., 716-734 (1925). 102 references.

GRAPHITE

BINAGHI, R. Sulla graphitite. Ann. chim. appl. 14: 71-102 (1924). 108 footnotes.

JONES, WALTER B. Summary report on graphite in Alabama. Ala. Geol. Survey, Circular 9, 1929. 27 p. Bibl. footnotes.

KAUSCH, O. Der Graphit. Halle, Knapp, 1930. 247 p. Bibl., p. 179-185, 185-204. Patents, p. 229-247.

TYLER, PAUL M. Graphite. II. Domestic and foreign deposits. U. S. Bur. Mines, Information Circ. 6122, 1929. 25 p. Mimeographed. 39 footnotes.

GREENSAND *

SHREEVE, R. NORRIS. Greensand bibliography up to 1930. With a chapter on zeolite water softening. U. S. Bur. Mines, Bull. 328. 1930. 78 p.

GROWTH

ARRHENIUS, A. Hydrogen ion concentration, soil properties and growth of

higher plants. Arkiv. Bot. 18, no. 1: 41-52 (1922). 250 references.

CALVERT, PHILIP P. Different rates of growth among animals with special reference to the *Odonata*. Proc. Am. Phil. Soc. 68: 269-274 (1929). 114 references.

EISENMENGER, W. S. Toxicity, additive effects and antagonism of salt solutions as indicated by growth of wheat roots. Bull. Torrey Bot. Club 55: 261-304 (1928). 74 references.

GUDERNATSCH, F. Entwicklung und Wachstum. In Hirsch, Handb. inneren Sekretion 2: 1707-1741 (1929).

HAMMETT, FREDERICK S. Chemical stimulus essential for growth by increase in cell number. Protoplasma 7: 320-322 (1929). 48 references.

HAMMETT, FREDERICK S. Natural chemical equilibrium regulative of growth by increase in cell number. Protoplasma 11: 410-411 (1930). 35 references.

HENDERSON, HARRY O. The effect of feeding different amounts of calcium and phosphorus upon the growth and development of dairy animals. West Va. Agr. Expt. Sta., Bull. 231. 1930. 55 p. Bibl., p. 51-55.

HICKS, PHYLLIS A. Chemistry of growth as represented by carbon-nitrogen ratio. Regeneration of willow cuttings. Bot. Gaz. 86: 208-209 (1928). 28 references.

ROBBINS, W. J., et al. Growth. New Haven, Yale Univ. Press, 1928. 189 p. Bibl. at end of chapters.

SHIRLEY, HARDY L. The influence of light intensity and light quality upon the growth of plants. Am. J. Bot. 16: 388-389 (1929). 29 references.

TINCKER, M. A. H. The effect of length of day upon the growth and chemical composition of the tissues of certain economic plants. Ann. Bot. 42: 137-140 (1928). 73 references.

GUANIDINE

KUEN, FRANZ MEINRAD. Ueber die Bestimmung der Guanidine und über das angebliche Vorkommen derselben im Tetanieharn. Biochem. Z. 187: 283-306 (1927). 43 footnotes.

SICKEL, HANS. Guanidin, Kreatin, Kreatinin. In Abderhalden, Biochem. Handl. 12: 106-173 (1930). Numerous bibl. footnotes.

GUM BENZOIN TEST.* See CEREBROSPINAL FLUID.

GUMS

ZEMPLÉN, GÉZA. Gummisubstanzen. In Abderhalden, Biochem. Handl. 13: 12-20 (1931). Bibl. footnotes.

GYPSUM

- NEWLAND, DAVID H. The gypsum resources and gypsum industry of New York. New York State Museum Bull. No. 283. 1929. 188 p. Bibl., p. 180-184.
- TERRES, E. Gips als Rohstoff für die chemische Industrie. *Z. angew. Chem.* 44: 356-363 (1931). 30 footnotes.

GYPSUM PLASTER *

- HONUS, OTTO FR. Ueber Gipsmörtelstoffe. *Zement* 16: 1201-1204, 1227-1230, 1249-1252 (1927); *Rock Products* 31, no. 4: 78 (1928). 69 footnotes.
- ROSSMAN, J. Porous gypsum plaster products. *Rock Products* 32, no. 20: 74-77 (1929). 29 patent abstracts.
- ROSSMAN, J. Retarders for gypsum plaster. *Rock Products* 32, no. 23: 55-58 (1929). 66 patent abstracts.

GYPSUM WALLBOARD *

- ROSSMAN, J. Evolution of gypsum wall board. *Rock Products* 31, No. 5: 51-55 (1928). 95 patent abstracts.

HAFNIUM

- V. HEVESY, G. Hafnium. *In* Doelter, *Handb. Mineralchem.* 3, pt. 2: 1170-1175 (1926). 27 footnotes.
- TYLER, PAUL M. Hafnium. *U. S. Bur. Mines, Information Circ.* 6457. 1931. 11 p. 22 footnotes.

HAIR

- WINTER, FRED. Haarfarben und Haarfärbung. Vienna, Springer, 1930. 133 p. Bibl., p. 129.
- See also* FUR, WOOL.

HALOCHROMY

- BLUMBERGER, J. S. PETRUS. De solvatochromie der ketonen. *Chem. Weekblad* 24: 454-462 (1927). About 60 references.

HALOGENS: Removal of.*

- BAUER, HUGO. Dehalogenieren. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 2: 2971-3078 (1931). Numerous bibl. footnotes.

HEART *

- KISCH, BRUNO. Pharmakologie des Herzens. *In* *Handbuch der normalen und pathologischen Physiologie* 7, pt. 1: 712-862 (1926). Bibl. footnotes.
- V. WEIZSÄCKER, V. FRHR. Stoffwechsel und Wärmebildung des Herzens. *In* *Handbuch der normalen und pathologischen Physiologie* 7, pt. 1: 689-711 (1926). Bibl. footnotes.

HEAT TRANSFER

- COLBURN, ALLAN P., and HOUGEN, OLAF A. Studies in heat transmission particularly as applied to tubular gas condensers. *Univ. Wisconsin, Eng. Expt.*

Sta. Series, Bull. 70. 1930. 158 p. Bibl., p. 135-138. 82 references.

- WATTS, A. S., and KING, R. M. Relative heat transfer through refractories. *Ohio State Univ., Eng. Expt. Sta., Bull.* No. 64. 1931. 32 p. Bibl., p. 28-32.

HEMICELLULOSE

MITCHELL, ESTHER M. Microchemical study of hemicelluloses of endosperms and cotyledons. *Am. J. Bot.* 17: 137-138 (1930). 39 references.

ZEMPLÉN, GÉZA. Hemicellulosen. *In* Abderhalden, *Biochem. Handl.* 13: 20-33 (1931). Bibl. footnotes.

See also CELLULOSE.

HEMOGLOBIN

ANSON, M. L., and MIRSKY, A. E. Hemoglobin, the heme pigments and cellular respiration. *Physiol. Rev.* 10: 543-546 (1930). 150 references.

BARCROFT, JOSEPH. L'hémoglobine et son rôle biologique. *Compt. rend. soc. biol.* 10, Réunion plénière, 22-26 (1928). 65 references.

BARCROFT, JOSEPH. The respiratory function of the blood. Part 2. Hemoglobin. 2nd ed. London, Cambridge Univ. Press, 1928. 200 p. Bibl. through text. (German edition also.)

DRAKIN, DAVID L., and WAGGONER, C. STANLEY. Hemoglobin maintenance and production upon synthetic diets. *J. Biol. Chem.* 89: 74-75 (1930). About 75 references.

ENGELHARDT, W. Zur Frage nach den antigenen Eigenschaften des Hämoglobins. *Biochem. Z.* 163: 195-196 (1925). 25 references.

GREEN, ARDA A. The solubility of hemoglobin in concentrated salt solution. The effect of electrolytes on the solubility of hemoglobin in solutions of varying hydrogen ion activity. *J. Biol. Chem.* 93: 515-516, 541-542 (1931). 56 references.

HENRIQUES, O. M. Ueber Carbhämoglobin. *Ergebnisse Physiol.* 28: 688-689 (1929). About 150 references.

KÜSTER, WILLIAM. Der Abbau des Hämatins und der Porphyrine. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 8: 251-300 (1921). Bibl. footnotes.

KÜSTER, WILLIAM. Die eisenhaltige Komponenten der Blutfarbstoffes. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 8: 201-222 (1921). Bibl. footnotes.

KÜSTER, WILLIAM. Studien auf dem Gebiete der Porphyrine. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 8: 223-250 (1921). Bibl. footnotes.

Oxyhaemoglobin. Index-Cat., S. G. O., 3rd ser., 8: 536-537 (1929). 37 references.

ROBSCHT-ROBBINS, F. S. Regeneration of hemoglobin and erythrocytes. *Physiol. Rev.* 9: 706-709 (1929). 132 references.

SANFORD, ARTHUR H. Clinical and physiologic problems related to hemoglobin (American literature for 1926-1927). *Folia Hematol.* 37: 127-128 (1928). 24 references.

SCHULZ, N. Darstellung von Blutfarbstoffen. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 8: 185-200 (1921). Bibl. footnotes.

See also BIOCHEMISTRY (Peters and Van Slyke), BLOOD PIGMENTS.

HEMOLYSIS

JOLTRAIN, ÉDOUARD. Les urticaires; crises hémoclasiques. Paris, Doin, 1930. 417 p. Bibl., p. 375-410.

RHODE, HEINRICH. Ueber Hämolyse durch Morphin und seinen Homologen. *Biochem. Z.* 131: 560-569 (1922). 30 footnotes.

WELLS, H. G. Hemolysis or erythrocytolysis. In *his* Chemical Pathology, 5th ed., 236-258 (1925). 179 footnotes.

HEPTALDEHYDE *

Heptylaldehyde. In *Wagner, Die Aldehyde*, 1929: 128-143. 80 footnotes.

HETEROCYCLIC COMPOUNDS

KAUTZSCH, KARL, and SCHMIDT, JULIUS. Die biologisch wichtigen stickstoffhaltigen heterozyklischen Grundverbindungen. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 4: 341-916 (1924). Bibl. footnotes.

HEXAMETHYLENETETRAMINE

ALTPETER, J. Das Hexamethylentetramin und seine Verwendung. Halle, Knapp, 1931. Bibl. at end of chapters. About 500 references. Patent list, p. 174.

COHN, G. Hexamethylentetramin. In *Ullmann, Enzyk. tech. Chem.*, 2nd ed., 6: 136-140 (1930). Many patent references through the text.

HEXOSIDASES.* See ENZYMES (Hesse).

HIPPURIC ACID

MAHN, HERBERT. Hippursäure. In *Abderhalden, Biochem. Handl.* 12: 370-373 (1930). Bibl. footnotes.

HISTAMINE

BEST, C. H., and MCHENRY, E. W. Histamine. *Physiol. Rev.* 11: 468-477 (1931).

FELDBERG, WILHELM, and SCHILF, E. Histamin, seine Pharmakologie und Bedeutung für die Humoralphysiologie. Berlin, Springer, 1930. 582 p. Bibl. footnotes.

FÉNYES, GEORG. Ueber die Wirkung des Histamins. *Wiener Archiv innere Medizin* 20: 317-318 (1930).

FINDLAY, G. M. Histamines and infection. *J. Path. Bact.* 21: 643-644 (1928). 32 references.

KÜPPER, ANTON. Biologie und Physiologie des Histamins. *Ergebnisse Physiol.* 30: 153-159 (1930). 228 references.

MAHN, HERBERT. Histamin. In *Abderhalden, Biochem. Handl.* 12: 199-209 (1930). Bibl. footnotes.

HISTIDINE

MAHN, HERBERT. Histidin. In *Abderhalden, Biochem. Handb.* 12: 717-738 (1930). Bibl. footnotes.

HISTONES

KOSSEL, A. Protamine und Histone. Leipzig, Franz Deuticke, 1929. 97 p. Bibl., p. 86-93. 200 references.

HISTORY

HARROW, BENJAMIN. The making of chemistry. New York, John Day Co., 1930. 223 p. Bibl., p. 210-215.

JAFFE, BERNARD. Crucibles; the lives and achievements of the great chemists. New York, Simon and Schuster, 1930. 377 p. Bibl., p. 354-364.

VON LIPPMANN, EDMUND O. Geschichte des Zuckers seit den ältesten Zeiten bis zum Beginn der Rübenzucker-Fabrikation. Berlin, Springer, 1929. 824 p. Bibl. footnotes.

METZGER, HÉLÈNE. Newton, Stahl, Boerhaave et la doctrine chimique. Paris, Alcan, 1930. 332 p. Bibl., p. 309-332.

MOORE, F. J. A history of chemistry. 2nd ed. New York, McGraw-Hill, 1931. 324 p. Bibl. at end of chapters.

WALDEN, PAUL. Mass, Zahl und Gewicht in der Chemie der Vergangenheit. Sammlung chem., chem.-tech. Vorträge, N. F., No. 8. 1931. 106 p. Bibl. footnotes.

WEEKS, M. E. The discovery of the elements. *J. Chem. Education* 9: 10, 20-21, 29-30 (1932). 72 references.

See also ALCHEMY.

HOMEOSTASIS *

CANNON, WALTER B. Organization for physiological homeostasis. *Physiol. Rev.* 9: 427-431 (1929). 126 references.

HONEY. See METABOLISM (Armbruster).

HORMONES

ASHER, LEON. Hormone. In *Jahresber. Physiol. exptl. Pharmakol.* 1: 240-249 (1920). Bibl. footnotes.

BACQ, Z. M. Contribution à l'étude de l'influence des glandes sexuelles sur

HORMONES—Cont'd

- le métabolisme. *Ann. physiol. physicochim. biol.* 5: 703-708 (1929).
- BERNHARDT, HERMANN. Endokrinologie. *Deut. med. Wochschr.* 54: 1384, 1426 (1928). 152 references.
- BREITMANN, M. Funktionelle Diagnostik der endokrinen Erkrankungen. *In* Hirsch, *Handb. inneren Sekretion*, 3: 1879-1899.
- BUGBEE, E. P., SIMOND, A. E., and GRIMES, H. M. Anterior pituitary hormones. *Endocrinology* 15: 53-54 (1921). 47 references.
- COLLIP, J. B. Further observations on an ovary-stimulating hormone of the placenta. *Can. Med. Assoc. J.* 22: 772-774 (1930). 124 references.
- COURRIER, R. Les hormones sexuelles femelles. *Compt. rend. soc. biol.* 107: 1408-1412 (1931). 139 references.
- EHRENBERG, RUDOLF. Die Hormone. *In* *Jahresber. Physiol. exptl. Pharmacol.* 5: 658-676 (1924); 7: 607-614 (1926); 9: 584-593 (1928). *Bibl. footnotes.*
- FRANK, ROBERT A. Female sex hormones. Springfield, Ill., Thomas, 1929. 321 p. *Bibl.*, p. 149-173, 301-302. 528 references.
- GOSS, HAROLD, and COLE, H. H. Some chemical properties of the ovary-stimulating principle. *Endocrinology* 15: 222-224 (1931). 44 references.
- GUGGENHEIM, M. Die Chemie der Inkrete. *In* Hirsch, *Handb. inneren Sekretion*, 2: 135-167 (1929).
- HAMBLE, E. H. Clinical experience with follicular and hypophyseal hormones. *Endocrinology* 15: 192-194 (1931). 39 references.
- HARROWER, HENRY R. Practical endocrinology. Glendale, Calif., Pioneer Publ. Co., 1931. 704 p. List of endocrine books, p. 687-693.
- HORMONLEHRE. *In* *Jahresber. wiss. Biol.* 1: 269-289 (1926); 2: 232-251 (1929); 3: 242-264 (1928); 4: 264-289 (1929). Covers references from about 1600 journals.
- JAFFÉ, RUD., and BERBERICH, F. Hoden. *In* Hirsch, *Handb. inneren Sekretion* 1: 268-280 (1926).
- DE JOUGH, S. E., and LAQUER, E. Ueber weibliche (sexual) Hormone. *In* *Jahresber. Physiol. exptl. Pharmacol.* 7: 638-657 (1926). *Bibl. footnotes.*
- JOYET-LAVERGNE, PH. La physicochimie de la sexualité. Berlin, Borntraeger, 1931. 457 p. *Bibl.*, p. 395-445.
- JUNKMANN, K. Ueber hormonale Sterilization. *Z. angew. Chem.* 44: 163 (1931).
- KOMM, E. Ueber neuere Forschungen auf dem Hormongebiet. *Pharm. Zentralhalle* 72: 369-375 (1931). 30 footnotes.
- LAQUER, FRITZ. Chemie der Vitamine und Hormone. *In* Oppenheimer, *Handb. Biochem.* 2. Aufl., *Ergänzungsband*: 410-452 (1930). 501 footnotes.
- LAQUER, FRITZ. Weibliche Sexualhormone. *In* *Jahresber. Physiol. exptl. Pharmacol.* 9: 611-622 (1928). About 250 footnotes.
- LIPSCHUTZ, ALEX. Beziehungen zwischen Menge und Wirkung des weiblichen Sexualhormons. *Biochem. Z.* 215: 284-285 (1929). 44 references.
- MACHT, DAVID I., STICKELS, A. E., and SECKINGER, D. L. Effect of corpus luteum and ovarian extracts on the oestrus of the guinea pig. *Am. J. Physiol.* 88: 76 (1929). 38 references.
- MARANON, G., FRIAS ET FTEJERINA, J. V. Du facteur endocrinien dans la pathogénie de la néphrosé lipoidique. *Ann. méd.* 29: 261-262 (1931). 53 references.
- PAGE, IRVING H. Wirkung des Nebenschilddrüsenhormons auf Phosphatase. *Biochem. Z.* 223: 227 (1930). 30 references.
- SCHMAHL, P. J. R. Review of the literature on the endocrine system during the year 1929. *J. Am. Inst. Homeopathy* 23: 1200-1201 (1930).
- TRENDELENBURG, PAUL. Die Hormone, ihre Physiologie und Pharmakologie. Bd. I. Keimdrüsen, Hypophyse, Nebennieren. Berlin, Springer, 1929. 351 p. Extensive *bibl. footnotes.*
- TRIER, GEORG. Hormone. *In* *his* *Die Alkaloide*, 2. Aufl., 817-860 (1931). *Bibl. footnotes.*
- TURNER, C. W., and FRANK, A. H. The effect of the estrus producing hormone on the growth of the mammary gland. *Univ. Mo., Agr. Expt. Sta., Research Bull.* No. 145. 1930. 56 p. *Bibl.*, p. 54-56. 48 references.
- WADEHN, F. Neue Forschung auf dem Gebiete der Hormone. *Z. angew. Chem.* 44: 317-323 (1931). 63 footnotes.
- ZONDEK, S. G., and BANDMANN, M. Hormone und Vitamine in ihren Beziehungen zum Mineralstoffwechsel. *In* Oppenheimer, *Handb. Biochem.*, 2. Aufl., *Ergänzungsband*: 453-522 (1930). 510 footnotes.
- See also DIGESTION (Ivy), INSULIN, PHARMACEUTICALS (Munch), SECRETIN, VITAMINS.

HUMIC ACID

FUCHS, W. Huminsäuren. *Kolloid-Z.* 52: 248-251, 350-356; 53: 124-126 (1930). 83 footnotes.

LIESCHE, KURT. Studien über Bildung und Zersetzung von Humusstoffen. *Landw. Jahrb.* 68: 435-488 (1929). 175 footnotes.

SCHREINER, O., and DAWSON, P. R. Chemistry of humus formation. *Proc. Papers First Intern. Congress Soil Sci.* 3: 261-263 (1926). 64 references.

WAKSMAN, S. A. Cellulose as a source of humus in the soil. *Proc. Papers First Intern. Congress Soil Sci.* 3: 701-702 (1928). 30 references.

WAKSMAN, SELMAN A., and REUSSER, H. W. Ueber die chemische Natur und der Ursprung des Humus im Erdboden. *Celluloschemie* 11: 209-220 (1930). 40 footnotes.

See also LIGNITE.

HYDRATION*

BLÜH, OTTO. Die Hydratation. *Protoplasma* 3: 114-116 (1928).

HYDROCARBONS

EGLOFF, GUSTAV, SCHAAD, R. E., and LOWRY, C. D., JR. The decomposition of the paraffin hydrocarbons. *J. Phys. Chem.* 34: 1736-1740 (1930). 248 references.

EGLOFF, G., SCHAAD, R. E., and LOWRY, C. D., JR. Oxidation mechanism of the paraffin hydrocarbons. *Ind. Eng. Chem.* 21: 790-791 (1929). 62 references.

EGLOFF, GUSTAV, SCHAAD, R. E., and LOWRY, C. D., JR. Decomposition and polymerization of the olefinic hydrocarbons. *J. Phys. Chem.* 35: 1900-1903 (1931). 160 references.

EGLOFF, G., SCHAAD, R. E., and LOWRY, C. D., JR. The halogenation of the paraffin hydrocarbons. *Chem. Reviews* 8: 75-80 (1931). 197 references.

FARAGHER, W. F., MORRELL, J. C., and LEVINE, I. M. Determination of olefin and aromatic hydrocarbons. *Ind. Eng. Chem., Anal. Ed.*, 2: 23-24 (1930). 105 references.

SPINNER, HANS. Allgemeine Methoden zur Nachweis von Kohlenwasserstoffen. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 4: 1-61 (1924). Bibl. footnotes.

HYDROGEN

BONHOEFFER, K. F. Ueber die Eigenschaften der freien Wasserstoffatome. *Ergebnisse exakt. Naturwissenschaft.* 6: 229-230 (1927). 39 references.

HYDROGEN FLUORIDE

SIMONS, J. H. Hydrogen fluoride and its solutions. *Chem. Reviews* 8: 234-235 (1931). 30 references.

HYDROGEN-ION CONCENTRATION

CŮPR, V. Advances in the potentiometric determination of hydrogen ions. *Chem. Listy* 25: 79-83, 104-107 (1931). 60 references.

CŮPR, V. Determination of hydrogen-ion concentration with quinhydrone electrodes. *Chem. Listy* 23: 81-86 (1929).

GRANT, J. The measurement of hydrogen-ion concentration. New York, Longmans, 1930. 159 p. Bibls., p. 28-29, 74-76, 101-102, 137-140.

KOLTHOFF, I. M. The colorimetric and potentiometric determination of pH. Outline of electrometric titrations. New York, Wiley, 1931. 167 p. Bibl. in preface.

PALITZSCH, SVEN. Manual pratique de l'analyse de l'eau de mer. III. Détermination des ions hydrogène par la méthode colorimétrique. *Bull. l'inst. océanographique*, No. 409. 1922. 31 p. Bibl., p. 26-28.

SMALL, JAMES. Hydrogen-ion concentration in plant cells and tissues. Berlin, Borntraeger, 1929. 421 p. Bibl., p. 384-409.

SNYDER, E. F. Factors affecting the determination of hydrogen ions, with special reference to soils. *Soil Research* 1: 236-238 (1929). 37 references.

WEBER, KAILO. Methods for the determination of hydrogen ion concentration. *Arhiv. hem. farm.* 2: 146-157 (1928).

WILLETS, WILLIAM R. Hydrogen-ion methods in the paper industry. *Paper Trade J.* 93, no. 1: 40-41 (1931). 94 references.

HYDROGEN PEROXIDE

ASKENASY, PAUL, and ROSE, RUDOLF. Zur Kenntnis der Herstellung von Wasserstoffperoxyd und Bariumperoxyd mittelst Kohlensäure. *Z. anorg. allgem. Chem.* 189: 33-35 (1930). 96 references.

HYDROGEN SULFIDE

MELLOR, J. W. Hydrogen sulphide. In *his Inorg. Theor. Chem.* 10: 146-154 (1930).

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. H. Hydrogen sulphide. In *Friend, Textbook Inorg. Chem.*, 7, pt. II: 47-66 (1931). About 200 footnotes.

HYDROGENATION

ELLIS, CARLETON. Hydrogenation of organic substances, including fats and fuels. 3d ed. New York, Van Nostrand, 1930. 986 p. Contains references.

HYDROGENATION—Cont'd

LUSH, E. J. Catalytic hydrogenation. I. Vegetable oils and fats. *Ind. Chemist* 3: 200 (1927). 31 references.

VRABELY, VERA. Method of catalytic hydrogenation. *Magyar Chem. Folyóirat* 35: 28-32, 38-43 (1929).

See also ADSORPTION (Müller), FUELS (Zerbe).

HYDROLYSIS

WALDSCHMIDT-LEITZ, E. Hydrolysen im Organismus. *Z. angew. Chem.* 44: 573-578 (1931). 61 footnotes.

HYDROSULFITES

COHN, G. Hydrosulfit. In Ullmann, *Enzyk. tech. Chem.*, 2nd ed., 6: 211-217 (1930). References, especially patents, through text.

HYDROXIDES

FRICKE, R. Einige Gesichtspunkte zu den Wandlungen der Oxyhydrate. *Kolloid-Z.* 49: 229-243 (1929). 79 references.

HYDROXYL GROUP

HAHN, GEORG. Die Hydroxylgruppe. In Houben, *Meth. org. Chem.*, 3d Aufl., 3: 1-131 (1930). Bibl. footnotes.

HYGIENE

CAIN, JOHN R. Principles and practice of hygiene. Philadelphia, Blakiston, 1931. 251 p. Bibl., p. 235-238.

CLUBER, E. H. Progress and present status of industrial hygiene in the Union of South Africa. *J. Ind. Hygiene* 11: 214-215 (1929).

HASLAM, J. F. C. Recent advances in preventive medicine. London, Churchill, 1930. 328 p. References at the end of each chapter. Contains a chapter on vitamins by S. J. Cowell.

JOINT COMMITTEE ON HEALTH PROBLEMS IN EDUCATION. Health education. New York, 1930. 251 p. Bibl., p. 245-251.

O'BRIEN, RUTH, PETERSON, ESTHER C., and WORNER, RUBY K. Bibliography on relation of clothing to health. U. S. Dept. Agr., Home Economics Bureau, Misc. Publ. 62. 146 p.

PRESSMAN, MILDRED B. A bibliography of camp safety hygiene and sanitation. New York, National Safety Council, 1929. 12 p.

REILLY, ESTELLE M. Children in the house. New York, Rand McNally, 1929. 80 p. Bibl., p. 51-80.

SAYERS, R. R. Effect on workers of air conditions. U. S. Bur. Mines, Information Circ. 6439. 1931. 33 p. 65 footnotes.

Schools, hygiene of. Index-Cat., S. G. O., 3rd ser., 9: 462-464 (1931).

TURNER, CLAIR ELSMERE. Personal and community health. 3rd ed. St. Louis, Mosby, 1930. 443 p. Bibl., p. 431-436.

VIBOKEL, LUCIEN. La technique moderne de la propagande d'hygiène sociale. Paris, Editions de "La Vie Saine." 1930. 734 p. Bibl., p. 369-401, 571-710.

Serial

Bulletin of Hygiene. 1+. 1926+. Covers industrial hygiene, sanitation, food and nutrition, bacteriology and immunity.

HYPERTENSION*

GAGER, LESLIE T. Hypertension. Baltimore, Williams and Wilkins, 1930. 158 p. Bibl., p. 127-148. 505 references. Includes chemical factors.

HYPNOTICS. See PHARMACEUTICALS (Munch).

HYPOGLYCEMIA*

GANNON, GEORGE D., and TENERY, WM. C. Hypoglycemia. *Arch. Internal Med.* 47: 829-854 (1931). 51 footnotes.

HYPOPHYSIS*

ASCHNER, B. Physiologie der Hypophyse. In Hirsch, *Handb. inneren Sekretion* 2: 362-374 (1929).

PENAU, H., BLANCHARD, L., and SIMONNET, H. L'hypophyse. Paris, Presse Univ., 1929. 575 references. Includes chemistry and pharmacology.

PERITZ, G. Die Hypophyse. In Oppenheimer, *Handb. Biochem.*, 2nd ed., 9: 435-482 (1927). 217 footnotes.

TRENDELENBURG, PAUL. Hypophyse. In *his Die Hormone*, I: 98-184 (1929). Extensive bibl. footnotes.

HYPOSULFUROUS ACID

MELLOR, J. W. Hyposulphurous acid and the hyposulphites. In *his Inorg. Theor. Chem.* 10: 178-180, 184 (1930).

IMMUNITY

Antigene, Antikörper. In *Jahresber. Physiol. exptl. Pharmacol.* 1: 854-888; 2: 594-627; 3: 1215-1248; 4: 666-706; 5: 1515-1556; 6: 743-778; 7: 1650-1681; 8: 521-558; 9: 1328-1409; 10: 540-584 (1920-1929). Extensive bibl. covering these years.

ARKWRIGHT, J. A., et al. Immunity. Medical Research Council (Gt. Brit.), System of Bacteriology in Relation to Medicine, Vol. 6. 1931. 537 p. Bibl. at end of each section.

HAMMERSCHMIDT, JOHANN. Immunität und Verwandtes. In *Jahresber. Physiol. exptl. Pharmacol.* 5: 625-657 (1924); 7: 973-1000 (1926). Bibl. footnotes.

KANAI, T. J. Biochemische Untersuchungen über die Entstehung der

Typhusimmunität. *Biochem. Z.* 132: 52 (1922). 26 references.

KLOPSTOCK, ALFRED. Immunität und Verwandtes. In *Jahresber. Physiol. exptl. Pharmacol.* 9: 833-863 (1928). Bibl. footnotes.

LEVINTHAL, WALTER. Neuere Forschung über die Struktur der bakteriellen Antigene. *Centr. Bakt., Parasitenk., I Abt., Orig.*, 110: 42-44 (1929).

OTTENSOOSER, F., and STRAUSS, E. Immunochemische Untersuchungen über Globin und Globinderivate. *Biochem. Z.* 193: 426-463 (1928). Bibl. footnotes.

SACHS, H. Antigenstruktur und Antigenfunktion. *Ergebnisse Hygiene, Bakteriologie, Immunitätsforschung u. exptl. Therapie* 9: 45-53 (1928).

SCHLOSSBERGER, HANS. Antitoxine und Toxine. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 3: 116-151 (1925). 222 references.

WELLS, H. G. Chemistry of the immunity reaction. In *his Chemical Pathology*, 5th ed., 157-235 (1925). 518 footnotes.

WOLFSOHN, GEORG. Immunität, Immunodiagnostik und aktive Immunisierung im Dienste der Chirurgie. *Stuttgart, Enke*, 1924. 371 p. Bibl. at end of each chapter.

See also ANTIGENS, TOXINS.

INDICATORS

FRESENIUS, R. Neuere Indikatoren. *Z. angew. Chem.* 42: 892-895 (1929). 36 footnotes.

KÜHN, S., and SCHERF, E. Ueber zwei neue Indikatorengemische, den Komplex Indikator für pH 7.0-12.0 und den Neokomplex-Indikator für pH 4.0-10.0 und über die Feldmethoden zur kolorimetrischen Bestimmung des pH von Boden. *Proc. Papers First Intern. Congress Soil Sci.* 2: 19-21 (1928). 45 references.

See also HYDROGEN-ION CONCENTRATION.

INDIGO

COHN, G. Künstlicher Indigo. In *Ullman, Enzyk. tech. Chem.*, 2nd ed., 6: 233-244 (1930). References, especially patents, through text.

INDIUM

PRIEBRAM, RICHARD. Indium. In *Doelter, Handb. Mineralchem.* 3, pt. 2: 537-541 (1926). 40 references.

See also GALLIUM.

INDOLE

SICKEL, HANS. Indol und Indolabkömmlinge. In *Abderhalden, Biochem. Handl.* 12: 234-266 (1930). Bibl. footnotes.

INDUCED REACTIONS*

HALE, DANFORTH R. Induced reactions and the higher oxides of iron. *J. Phys. Chem.* 33: 1663-1664 (1929). 71 references.

INDUSTRIAL CHEMISTRY

Bibliographies des livres français sur l'industrie et la technologie, 1919-1930. Paris, 1930. 234 + lxiv p.

KOETSCHAU, RUDOLF. Einführung in die theoretische Wirtschaftschemie. Dresden, Steinkopff, 1929. 155 p. Bibl. included in "Anmerkungen," p. 139-152.

MEADE, RICHARD KIDDER. The chemists' pocket manual. 4th ed. Easton, Chem. Pub. Co., 1929. 533 p. Contains bibls.

INDUSTRIAL POISONING

CHEMICAL WARFARE SERVICE. Proceedings of a board of the Chemical Warfare Service appointed for the purpose of investigating conditions incident to the disaster at the Cleveland Hospital Clinic, Cleveland, Ohio, on May 15, 1929. 104 p. Bibl., p. 103-104.

FLURY, F., and ZERNIK, F. Schädliche Gase. Berlin, Springer, 1931. 637 p. Numerous short bibls. through the book.

HAMILTON, ALICE. Benzene poisoning. *Arch. Path.* 11: 632-637 (1931).

HERTZ, ARTHUR. Zur Frage der chronischen Quecksilbervergiftung. *Klin. Wochschr.* 8: 544 (1929). About 40 references.

HIRSZOWSKI, A. Industrial poisoning in the manufacture of coal tar dyes and intermediates and methods of preventing it. *Przemysl Chem.* 12: 370-378, 419-429, 481-492, 535-540, 587-604 (1928).

LORETI, FRANCO. Sull'intossicazione sperimentale cronica per inalazione di vapori mercuriali. *Arch. farm. sper.* 48: 372-374 (1930). 46 references.

MCCORD, CAREY P. Benzol (benzene) poisoning. Cincinnati, O., Industrial Health Conservancy Labs., 1931. 78 p. Mimeographed. Bibl., p. 67-78. 64 references are given through the text.

MEUHLBERGER, C. W., LOEVENHART, A. S., and O'MALLEY, T. S. Arsine intoxication; a case of suspected poisoning in the steel industry. *J. Ind. Hygiene* 10: 143-146 (1928).

Poisoning, industrial. *Index-Cat.*, S. G. O., 3rd ser., 8: 1068-1069 (1929).

SMITH, A. R. Chronic benzol poisoning among women industrial workers. N. Y. State Dept. of Labor, Special Bull. 150: 63-64 (1927); *J. Ind. Hygiene* 10: 92-93 (1928).

INK

- ROSSMAN, JOSEPH. Printing-ink patents. *Am. Ink Maker* 8, no. 8: 21-23; no. 9: 23-25, 41, 43; no. 10: 27, 29, 41; no. 12: 27, 29 (1930); 9, no. 1: 25, 27 (1931).

INORGANIC CHEMISTRY

- BRÄUER, ADOLF, and D'ANS, J. Fortschritte in der anorganisch-chemischen Industrie. Dritter Band. 1924-1927. Berlin, Springer, 1930. 1524 p. Reproduction of patents. Patent index, p. 1486-1510.
- FEITKNECHT, WALTER. Ueber topochemische Umsetzungen fester Stoffe in Flüssigkeiten. *Fortschritte Chem., Physik, physik. Chem.* 21, No. 2. 1930. 56 p. Bibl., p. 54-56. 111 references.
- NOLL, VICTOR H. Laboratory instruction in the field of inorganic chemistry. Minneapolis, Univ. Minn. Press, 1930. 164 p. Bibl., p. 113-120.
- PASCAL, P. *Traité de chimie minérale*. Paris, Masson, 1930. (To be complete in 12 volumes.) Contains numerous bibls. *E. g.*, Vol. 1 contains 715 references on water and 450 references on oxygen.
- ROJAN, C. A. Neuere Arbeiten aus dem Gebiete der anorganischen und physikalischen Chemie (1925-1927), sowie der analytischen Chemie (1927) unter besonderer Berücksichtigung der Pharmazie. *Arch. Pharm.* 1929: 43-60. 132 footnotes.
- WAESER, B. Entwicklungstendenzen der anorganischen Gross- und Düngemittelindustrie in den letzten Jahren. *Metallbörse* 21: 939-940, 987-988, 1035-1036, 1913-1914, 1945-1946, 1978 (1931). Bibl. footnotes.
- WAESER, B. Technische Fortschritte der anorganischen Chemie im Jahre 1929. *Metallbörse* 20: 733-734, 789-790, 845-846, 901-902, 957-958, 1014-1016 (1930).
- ZAWIDZKI, J. Chronological review of books on inorganic chemistry. *Przemysl Chem.* 13: 204-206 (1929).

INSECTICIDES

- DEUTSCHES REICH. *Biologische Reichsanstalt für Land- und Forstwirtschaft*. Bibliographie der Pflanzenschutzliteratur. Berlin, 1921 +. 1914-1919, 463 p. 1920, 71 p. 1921, 198 p. 1922, 162 p. 1923, 176 p. 1924, 226 p. 1925, 229 p. 1926, 231 p. 1927, 250 p. 1928, 251 p. 1929, 246 p. 1930, 245 p.
- DRIGGERS, BYRLEY F. Lead arsenate studies on cranberry bogs in New Jersey. *N. J. Agr. Expt. Sta., Bull.* 480. 1929. 36 p. 43 references.

- GINSBURG, JOSEPH M. Test to determine toxicity of pyrethrum vapors to honeybees. *J. Agr. Research* 40: 1056-1057 (1930).

- GRATZ, L. O. Potato spraying and dusting experiments in Florida, 1924 to 1929. *Fla. Agr. Expt. Sta., Bull.* 222. 1930. 39 p. Bibl., p. 37-39. 72 references.

- HOOD, CLIFFORD E. Fish oil as an adhesive in lead-arsenate sprays. *U. S. Dept. Agr., Tech. Bull.* No. 111. 1929. 28 p. Bibl., p. 27-28.

- KELLEY, VICTOR W. Effect of certain hydrocarbon oils on respiration of foliage and dormant twigs of the apple. *Univ. Ill., Agr. Expt. Sta., Bull.* 348: 371-406. Bibl., p. 405-406.

- KLEIN, F. Die neueren Patente auf dem Gebiete des Pflanzenschutzes. *Metallbörse* 20: 1797-1798, 1910-1911 (1930). German patents through text.

- MARTIN, HUBERT. The scientific principles of plant protection. London, Arnold, 1928. 316 p. Bibl. at end of each section.

- O'KANE, W. C., *et al.* Surface tension, surface activity and wetting ability factors in the performance of contact insecticides. I. Studies of contact insecticides. *N. H. Agr. Expt. Sta., Tech. Bull.* 39. 1930. 44 p. Bibl., p. 43-44. 39 references.

- PORTER, B. A., and SAZAMA, R. F. Influence of Bordeaux mixture on the efficiency of lubricating-oil emulsions in the control of the San José scale. *J. Agr. Research* 40: 765-766 (1930).

- RICHARDSON, C. H., and SHEPARD, H. H. The insecticidal action of some derivatives of pyridine and pyrrolidine and of some aliphatic amines. *J. Agr. Research* 40: 1014-1015 (1930).

- RUARK, R. C. Review of United States patents relating to pest control. Monthly. 1 +. 1928 +. Annotated. Author and subject index in each issue. Published by U. S. Dept. Agr.
- SWINGLE, H. S., and SNAPP, OLIVER I. Petroleum oils and oil emulsions as insecticides and their use against San José scale on peach trees in the South. *U. S. Dept. Agr., Tech. Bull.* No. 253. 1931. 48 p. Bibl., p. 42-48.

- See also FUMIGATION, PHARMACEUTICALS (Munch).*

INSULATION: Electrical.

- GEMANT, ANDREAS. Elektrophysik der Isolierstoffe. Berlin, Springer, 1930. 222 p. Bibl., p. 216-220.

- STÄGER, HANS. Elektrotechnische Isoliermaterialien. Stuttgart, Wiss. Verlagsges., 1931. 354 p. Bibl. footnotes.

- WARREN, HENRY W. H. Electrical insulating materials. London, Benn, 1931. 516 p. Bibl., p. 487-491.

INSULATION: Heat.*

MARSH, M. C. Thermal insulating properties of fabrics. *J. Textile Inst.* 22: 272-273T (1931). 64 references.

INSULIN

ANDERSON, M. D., and ANDERSON, A. B. Insulin und Glykogenbildung. *Ergebnisse Physiol.* 29: 370-371 (1929). 82 references.

BRAUN, C. E. The chemistry of some suggested insulin substitutes. *J. Chem. Education* 8: 2186-2187 (1931).

FÖRNER, D. W. Unbekanntes vom Insulin. München, 1929. 41 p. 137 references.

GEELMUYDEN, H. CHR. Die Einwirkung des Insulins auf den respiratorischen Stoffwechsel. *Ergebnisse Physiol.* 31: 1-4 (1931).

GLASER, ERHARD, and HALPERN, GEORG. Ueber die chemische Zusammensetzung des Insulins. *Biochem. Z.* 161: 127 (1925). 25 references.

GLASER, ERHARD, and HALPERN, GEORG. Ueber die Zusammensetzung des Insulins und seine Beziehungen zu Fermenten und Aktivatoren. *Wiener med. Wochschr.* 79: 363 (1929). 42 references.

GREVENSTUK, A. Ueber Insulin. *In Jahresber. Physiol. exptl. Pharmacol.* 7: 615-637 (1926). Bibl. footnotes.

HEONER, JOSEF, and WAGNER, O. Insulin und Fettstoffwechsel. *Biochem. Z.* 189: 329-330 (1927). 26 references.

LAQUER, FRITZ. Insulin. *In Jahresber. Physiol. exptl. Pharmacol.* 5: 676-705 (1925); 9: 594-610 (1928). Bibl. footnotes.

SENDRAIL, MARCEL. L'épreuve de tolérance à l'insuline. *Ann. méd.* 27: 289-312 (1920). Bibl. footnotes.

STAUB, H. Ueber Insulin und seine Wirkungsmechanismus. *Ergebnisse inneren Medizin u. Kinderheilkunde* 31: 121-126 (1927). 210 references.

See also DIABETES.

INTERFEROMETRY

BEWILGUA, L. Interferometrische Messung an einzelnen Molekülen der Chlor-Substitutionsprodukte des Methans. *Physik. Z.* 32: 281-282 (1931). 59 references.

MARK, H. Neuere Fortschritte bei der interferometrischen Bestimmung der Molekülgestalt. *Z. angew. Chem.* 44: 125-130 (1931). 52 footnotes.

INTERNAL SECRETIONS

ASHER, LEON. Allgemeine Physiologie der inneren Sekretion. *In Hirsch, Handb. inneren Sekretion*, 2: 34-35 (1929). 58 references.

Endokrines System. *In Jahresber. Physiol. exptl. Pharmacol.* 2: 296-323;

3: 1038-1065; 4: 508-540; 5: 1345-1374; 6: 565-593; 7: 1469-1502; 8: 378-407; 9: 1237-1266; 10: 387-422 (1920-1929). An extensive bibl. covering these years.

FISCHER-WASELS, B., and BERBERICH, J. Epithelkörperchen und innere Sekretion. *In Hirsch, Handb. inneren Sekretion*, 1: 458-472 (1926).

HIRSCH, MAX, ed. Handbuch der inneren Sekretion. Leipzig, Kabitzsch, 1926+. Three or more volumes. Contains many extensive bibls.

KOLLER, G. Die innere Sekretion bei wirbellosen Tieren. *Biol. Rev. Cambridge Phil. Soc.* 4: 301-306 (1929).

KRANZ, PETER, and VON DER OSTENSACKEN, HARALD. Innere Sekretion. Fortschritte der Zahnheilkunde 7: 315-317 (1931).

REMY, PAUL. Les sécrétions internes et les métamorphoses. *Ann. sci. nat., Zoologie*, (10) 7: 74-82 (1924).

Testicle, extract of; internal secretion of. *Index-Cat.*, S. G. O., 3rd ser., 10: 237, 238-239 (1932).

See also HORMONES, OVARY, PANCREAS, PARATHYROID GLAND, PINEAL GLAND, PITUITARY EXTRACT, PLACENTA, SUPRARENALS, THYMUS, THYROID.

INULIN

ZEMPLÉN, GÉZA. Kohlenhydrate der Inulingruppe. *In Abderhalden, Biochem. Handl.* 13: 99-107 (1931). Bibl. footnotes.

INVERTASE

PALMER, ALBERT H. The influence of hydrogen ion concentration on the properties and activity of invertase. Thesis, Columbia Univ., 1930. 53 p. Bibl., p. 49-52.

IODINE

COHN, G. Jod. *In Ullmann, Enzykl. tech. Chem.*, 2nd ed., 6: 276-286 (1930). References through text.

Jod. *Gmelins Handbuch der anorganischen Chemie*, System-Nummer 8. Part 1. 244 p. 1931. Covers physical and chemical properties. References through text.

OSSA, B. D. La extracción del yodo en la industria. *Caliche* 11: 517-521 (1930). 30 footnotes.

ROMAN, W. Die Entwicklung der Jodindustrie und ihre heutige wirtschaftliche Lage. *Z. angew. Chem.* 44: 9-15 (1931). 69 footnotes.

SCHARRER, KARL. Chemie und Biochemie des Jods. Stuttgart, Enke, 1928. 192 p. Bibl., p. 161-183, 191-192. About 600 references.

IODINE: Analytical.

FELLENBERG, TH., and STEINER, M. Das Jod. *Mikrochemie* 7: 242-267 (1929). 52 footnotes.

IODINE: Analytical—Cont'd

- LUNDE, GULBRAND. Das Jod. Die quantitative Bestimmung von Jod in anorganischem Material auf mikrochemischen Wege. *Mikrochemie* 7: 337-366 (1929). References through text.
- REITH, J. F. Neuere Beiträge zur Methodik der Mikrojodbestimmungen in Naturstoffen. *Biochem. Z.* 224: 240-241 (1930). 48 references.

IODINE: Biochemistry.

- BUCHHOLZ, BRUNO. Ueber den Jodgehalt menschlicher Organe. *Z. ges. exptl. Med.* 63: 197 (1928). 27 references.
- CAMERON, A. T. Iodine prophylaxis and endemic goiter. *Can. Pub. Health J.* 21: 495-506, 541-548 (1930). 60 references.
- COURTH, HANS. Untersuchungen über den Jodgehalt des Schweinekörpers in verschiedenen Organen und Entwicklungsstadien. *Landw. Jahrb.* 69: 597-598 (1929). 60 references.
- MALHOTRA, R. C. Permeability of iodine in some economic plants. *Protoplasma* 12: 19-22 (1931). 72 references.
- MAYRHOFER, A., and WASITZKY, A. Biochemische Studien über das Vorkommen kleiner Mengen von Jod und Fluor im Organismus. *Biochem. Z.* 204: 76-77 (1929). 42 references.
- ORR, J. B., and LEITCH, I. Iodine in nutrition. *Gt. Brit., Medical Research Council, Special Report series*, No. 123. 1929. 108 p. *Bibl.*, p. 98-102.
- ORR, J. B., and LEITCH, I. Iodine in practical nutrition. *Intern. Rev. Agr.*, pt. I, 21: 207-208 (1930). 35 references.
- PEABODY, WM. A. Iodine retention and distribution in rabbits. *J. Am. Pharm. Assoc.* 20: 554-555 (1931). 31 references.
- REID, HAROLD A. The use of iodine and its compounds in veterinary practice. London, De Gruy and Co., Ltd., 1929. 88 p. *Bibl.*, p. 79-84. 89 references.
- SCHARRER, K. Biochemie des Jods. *In* Oppenheimer, *Handb. Biochem.*, 2. Aufl., *Ergänzungsband*: 282-308 (1930). 150 references.
- See also SOIL.

IONIZATION

- KALLMANN, H., and ROSEN, B. Die Elementarprozesse der Ionisation durch Stoff materieller Teilchen. *Physik. Z.* 32: 543-544 (1931). 172 references.

IONS *

- RUBINSTEIN, D. L. Das Problem des physiologischen Ionenantagonismus. *Protoplasma* 4: 312-314 (1928). 60 references.

IRIDIUM

- COHN, G. Iridium. *In* Ullman, *Enzyk. tech. Chem.*, 2nd ed., 6: 261-266 (1930). References through text.
- SIRK, H. Iridium. *In* Doelter, *Handb. Mineralchem.* 3, pt. 2: 1153-1160 (1926). *Bibl. footnotes*.

IRON: Alloys

- ABORN, P. H., and BAIN, E. C. The wrought austenitic alloys. *In* Symposium on effect of temperature on the properties of metals (A. S. T. M.), 1931: 344-346. 53 references.
- DOWDELL, R. L. Phases of the metastable iron-carbon constitution diagram. *Metals and Alloys* 1: 515-517 (1930). 70 footnotes.
- EISENHUT, O., and KAUPP, E. Das System Eisen-Stickstoff. *Z. Elektrochem.* 36: 403-404 (1930).
- EPSTEIN, S. The cementite solubility line. *Metals and Alloys* 1: 599-561 (1930). 29 footnotes.
- GILLET, H. W. The unknown influence of oxygen and nitrogen on the iron-carbon system. *Metals and Alloys* 1: 237-239 (1929). 33 footnotes.
- HARDEN, OSCAR E. Effect of temperature on the properties of nitrided alloys. *In* Symposium on effect of temperature on the properties of metals (A. S. T. M.) 1931: 483-485. 37 references.
- KRYNITSKY, A. I. Status of the double iron-carbon diagram. *Metals and Alloys* 1: 469-470 (1930). 42 references.
- KÜHLEWEIN, H. Die Legierungen des ternären Systems Eisen-Nickel-Kobalt. *Physik. Z.* 31: 639-640 (1930). 59 references.
- LEITMEIER, HANS. Tellurisches Eisen und Nickeleisen. *In* Doelter, *Handb. Mineralchem.* 3, pt. 2: 767-809 (1926). *Bibl. footnotes*.
- MERICA, PAUL D. Constitution of iron-nickel alloys. *Trans. Am. Soc. Steel Treating* 15: 881-884 (1929). 33 references.
- PILLING, N. B., and WORTHINGTON, R. Effect of temperature on some properties of iron-chromium-nickel alloys. *In* Symposium on effect of temperature on the properties of metals (A. S. T. M.) 1931: 398-402. 77 references.
- SISCO, F. A. *Ed.* Iron-silicon alloys bibliography, compiled, classified and annotated by Iron Alloys Committee.

New York, Engineering Foundation, 1931. 347 p. Autographed from type-written copy. 900 references, from 1891 to 1930. Author index.

STOUGHTON, BRADLEY, and GREINER, EARL S. Progress notes on the iron-silicon equilibrium diagram. *Am. Inst. Mining Met. Eng., Iron and Steel Div.*, 1930: 155-185. Bibl. footnotes.

WEVER, FRANZ, and MÜLLER, ANTON. Ueber die Zweistoffsysteme Eisen-Bor und Eisen-Beryllium. *Mitt. Kaiser-Wilhelm-Institut für Eisenforschung* 11: 193-223 (1929). 66 footnotes.

YENSEN, T. D. Pure iron and allotropic transformations. *Am. Inst. Mining Met. Eng., Iron and Steel Div.*, 1929: 332-333. 26 references.

IRON: Biochemistry.

LAUDA, E., and HAAM, E. Die Beziehungen der Milz zum Eisenstoffwechsel. *Ergebnisse inneren Medizin u. Kinderheilkunde* 40: 750-757 (1931).

LINTZEL, WOLFGANG. Ueber die Resorption und Assimilation des Eisens. *Tierzüchtung u. Züchtungsbiol.* 17: 300-302 (1930). 124 references.

LINTZEL, WOLFGANG. Neuere Ergebnisse der Erforschung des Eisenstoffwechsels. *Ergebnisse Physiol.* 31: 844-848 (1931).

LINTZEL, W., and RADEFF, T. Ueber den Eisengehalt und Eisenansatz neugeborener und säugender Tiere. *Arch. Tierernährung, Tierzucht* 6: 358 (1931). 40 references.

MESSINI, M. Trasformazione e assorbimento dei sali ferrosi nel canale digerenti. *Arch. intern. pharmacodyn. therapie* 35: 215-217 (1929). 37 references.

MILLER, R. C., and FORBES, E. B. Utilization of the iron of protein food by the albino rat. *J. Nutrition* 4: 505 (1931). 31 references.

NAUMANN, EINAR. Die Eisenorganismen. *Intern. Rev. ges. Hydrobiol. u. Hydrog.* 24: 94-96 (1930). 32 references.

POLSON, CYRIL J. Fate of colloidal iron administered intravenously. *J. Path. Bact.* 31: 445-446 (1928). 30 references.

IRON: Chemistry.

BERWETH, F., and MICHEL, H. Meteor-eisen. In *Doelter, Handb. Mineralchem.* 3, pt. 2: 574-629 (1926). Bibl. footnotes.

Eisen. *Gmelins Handb. anorg. Chemie*, 8. Aufl. System-Nummer 59. Teil A and B. 1929-1930.

Teil A. Das Metall. 586 p. History, p. 1-47; iron in prehistoric times, 8-13; iron in historic times, p. 14-28; iron in modern times, p. 28-47; production of crude iron, p. 47-58; iron and steel wire production, p. 59; iron deposits, p. 71-137 (bibl. through text); iron minerals, p. 138-159; electrolytic methods of production, p. 185-212; chemical production, p. 212-217; physical properties, p. 225-246; crystallographic properties, p. 246-251; electrochemical behavior, p. 277-312; passivity, p. 313-358 (60 references on theory, p. 346-352); chemical behavior and corrosion, p. 358-422; technical iron, p. 423-511 (coke, p. 465-479; slag, p. 479-487; electric furnaces, p. 498-512); special bibls., p. 520-522, 522-525, 527, 545-551, 576-584; patents, p. 531-545, 552-553, 555-576, 584-586.

Teil B. Die Verbindungen des Eisens. 512 p. Bibls. through text. The more important compounds are as follows: Ferrous oxide, p. 26-36; magnetic oxide, p. 36-62; ferric oxide, p. 63-94; colloidal iron oxide, p. 96-114; ferrous hydroxide, p. 114-120; ferric hydroxide, p. 122-137; ferrous nitrate, p. 158-161; ferric nitrate, p. 161-173; iron fluorides, p. 173-183; iron chlorides, p. 184-319; iron bromides, p. 321-336; iron sulfides, p. 345-394; iron sulfates, p. 394-469; iron pentacarbonyl, p. 486-498; ferrous carbonate, p. 502-512; iron acetate, p. 521-530; iron oxalate, 532-536; iron cyanides, p. 560-655; complex iron cyanides, p. 657-742; iron silicates, p. 761-767; iron phosphates, p. 767-780.

JANDER, W. Verbindungen des zweiwertigen Eisen. In *Abegg, Handb. anorg. Chem.*, IV, pt. 3: B119-B133 (1930). 713 references.

KOPPEL, I. Carbonyle und Nitrosyle des Eisen. In *Abegg, Handb. anorg. Chem.*, IV, pt. 3: B460-B463 (1930). 106 references, arranged chronologically.

KOPPEL, I., et al. Eisen. In *Abegg, Handb. anorg. Chem.* IV, pt. 2A., 1931. Iron atom, p. 45-50; 207 references. Preparation of pure iron, p. 61-63; 115 references. Electrolytic preparation, p. 80-82; 109 references. Colloidal iron, p. 92-94; 76 references. Properties, p. 108-110; 124 references. Crystal form, p. 119-121; 98 references. Density, etc., p. 133-134; 105 references. Mechanical properties, p. 169-174; 213 references. Thermal properties, p. 190-191, 199; 133 references. Optical properties, p. 208-

IRON: Chemistry—Cont'd

210; 61 references. Magnetic properties, p. 262-268; 380 references. Electrical properties, p. 283-285, 297-300, 304-305; 275 references. Electrochemical properties, p. 332-336; 116 references.

KURTENACKER, A. Verbindungen des dreiwertigen Eisen. In Abegg, Handb. anorg. Chem. IV, pt. 3: B396-B422 (1930). 1168 references.

MARTIN, ERICH. Occlusion of hydrogen and nitrogen by pure iron and some other metals. Metals and Alloys 1: 835 (1930). 32 references.

SEIMENS, A. Verbindungen des vier- und fünfwertigen Eisen. In Abegg, Handb. anorg. Chem. IV, pt. 3: B433-B435 (1930). 65 references, arranged chronologically.

VOGEL, RUDOLF. Physikalisch-chemisches über Meteoreisen. In Doelter, Handb. Mineralchem. 3, pt. 2: 562-573 (1926). 16 footnotes.

See also IRON OXIDES (Ralston).

IRON: Electrometallurgy.*

KOTHNY, E. Bibliographie der Elektrometallurgie des technischen Eisen. Berlin, Ver. deut. Giessererfachleute, 1930. 66 p. Classified. Author index.

IRON: Metallurgy.

See IRON AND STEEL.

IRON: Ores.

GEIJER, PER ADOLF. Gallivare malmbält; geologisk beskrivning. Sveriges geologiska undersökning. Ser. Ca. Avhandlingar och uppsatser i 4:o, No. 22, 1930. 115 p. Bibl., p. 114-115.

MAGNUSSON, NILS H. Långbans malmltrakt; geologisk beskrivning. Sveriges geologiska undersökning. Ser. Ca. Avhandlingar och uppsatser i 4:o, No. 23, 1930. 111 p. Bibl., p. 101-104.

Report of the Ontario iron ore committee. Ontario, Dept. of Mines, 1924. 306 p. Bibl., p. 235-290.

IRON AND STEEL

AMEN, EINAR, and WILLNERS, HARRY. Study of gases in liquid steel. Jernkontorets Ann. 83: 264-265 (1928). 29 references.

ARPI, R. Fracture of quenched specimens as a quality test for tool steel. Jernkontorets Ann. 1931: 94-95. 42 references.

BARBEROT, ALPHONSE. Fabrication de l'acier au four Martin. Paris, Baillière, 1923. 543 p. Bibl., p. 531-535.

BAEDENHEUER, PETER, and ZEYEN, KARL L. Beiträge zur Kenntnis des

Graphits im grauen Gusseisen und seines Einflusses auf die Festigkeit. Mitt. Kaiser-Wilhelm-Institut für Eisenforschung 10: 23-38 (1928). 77 footnotes.

BENEDICKS, CARL, and LÖFQUIST, HELGE. Non-metallic inclusions in iron and steel. London, Chapman and Hall, 1930. 311 p. Bibl., p. 274-290; properties of slag substances, p. 291-292.

BOLTON, J. W., and BORNSTEIN, H. Effect of elevated temperatures on certain mechanical properties of gray cast iron and malleable iron. In Symposium on effect of temperature on the properties of metals (A. S. T. M.) 1931: 318-321. 60 references.

BRAMLEY, A., and BEEBY, G. H. Gaseous cementation of iron and steel. II. Cementation with the nitrogenous vapors of pyridine and methyl cyanide. Iron and Steel Inst., Carnegie Scholarship Mem. 15: 124-125 (1926). 51 references.

BRAMLEY, A., and JINKINGS, A. J. Gaseous cementation of iron and steel. I. Cementation by carbon monoxide. Iron and Steel Inst., Carnegie Scholarship Mem. 15: 68-69 (1926). 31 references.

BUREAU OF STANDARDS. Principles of the heat treatment of steel. Cleveland, Am. Soc. Steel Treating, 1928. 93 p. 211 references, p. 82-91.

COUTAGNE, AIMÉ. La fabrication des ferro-alliages, fontes électriques et métaux spéciaux. Paris, Baillière, 1924. 650 p. Contains bibl.

DANIEL, JOSEPH. Iron and steel manufacture in Washington, Oregon, California and Utah. Univ. of Washington, Eng. Expt. Sta. Series, Report No. 2. 1929. 69 p., Bibl., p. 62-65.

DIERKER, A. H., and KINNEAR, H. B. Résumé of published data on steel foundry practice. Ohio State Univ., Eng. Expt. Sta., Circ. No. 25. 1931. 55 p. Annotated bibl.

DODD, JAMES H. A history of production in the iron and steel industry in the Southern Appalachian states (1901-1926). Thesis, George Peabody College for Teachers, 1928. 145 p. Bibl., p. 143-145.

FINK, WILLIAM L., and CAMPBELL, E. D. Influence of heat treatment and carbon content on the structure of pure iron carbon alloys. Trans. Am. Soc. Steel Treating 9: 750-752 (1926).

FREEMAN, JOHN R., JR., and QUICK, WM. Tensile properties of rails and other steels at elevated temperatures. Am. Inst. Mining Met. Eng., Iron and Steel Div., 1930: 225-269. Bibl. footnotes.

- GERUSO, ROBERT L. The effect of cold work followed by annealing upon the physical properties of 0.22% carbon-0.89% manganese steel. Thesis, Columbia Univ., 1930. 48 p. Bibl., p. 41-47.
- HARDER, OSCAR E. Nitriding for the engineer. *Metals and Alloys* 2:142 (1931). 50 references.
- HATFIELD, W. H. Application of science to the steel industry. Cleveland, Am. Soc. Steel Treating, 1928. 154 p. Bibl. footnotes.
- HERTY, C. H., JR., and FITTERER, G. R. The physical chemistry of steel making: Deoxidation with silicon and the formation of ferrous silicate inclusions in steel. Pittsburgh, Carnegie Institute of Technology, 1928. Mining and Metallurgical Investigations, Bull. 36. 92 p. Bibl., p. 91-92.
- HERTY, C. H., JR., FITTERER, G. R., and CHRISTOPHER, C. E. Deoxidation of steel with silicon. U. S. Bur. Mines, Tech. Paper 492. 1931. 42 p. Bibl., p. 41-42. 52 references.
- IMHOFF, WALLACE G. Pickling of iron and steel. Cleveland, Penton, 1929. 195 p. Bibl., p. 147-182.
- JOSEPH, T. L., and BARRETT, E. P. Resistance of iron ores to descrepitation and mechanical work. Am. Inst. Mining Met. Eng., Iron and Steel Div., 1930: 375-377. 53 references.
- JUNGBLUTH, H. Fortschritte im Giessereiwesen in den Jahren 1928 und 1929. *Stahl u. Eisen* 50: 1091-1094, 1135-1138, 1169, 1172, 1202-1204 (1930). 158 footnotes.
- JUNGBLUTH, H., and HELLER, P. A. Fortschritte im Giessereiwesen. 1930. *Stahl u. Eisen* 51: 742-747, 772-775, 1373-1377, 1404-1407 (1931). 192 footnotes.
- KINSEY, V. EVERETT, and HOPKINS, THOMAS E. Index to iron and steel patents. Pittsburgh, American Compilation Co., 1930. 356 p. About 1800 patents.
- KLINGENSTEIN, THEODOR, and KOPP, HERMANN. Neuere Anschauungen und Erkenntnisse über Wesen und Eigenschaften des hochwertigen Gusseisens. In Geiger, *Handbuch der Eisen- und Stahlgiesserei*, 4: 445-500 (1931). Bibl. footnotes; bibl., p. 497-500.
- KOON, SIDNEY G. Iron and steel. *Mineral Ind.* 37: 358-359 (1928). 41 references. 38: 378-380 (1929). 41 references.
- LARSEN, B. M. Origin and effect of inclusions in steel. *Metals and Alloys* 1: 703-713, 763-769, 819-825 (1930). 75 footnotes.
- MCCAFFERY, R. S., *et al.* Determination of viscosity of iron blast-furnace slags. Am. Inst. Mining Met. Eng., Tech. Publ. No. 383: 53-54 (1931). 26 references.
- MCCLELLAND, E. H. Review of iron and steel literature. *Blast Furnace Steel Plant* 18: 122-123, 309-312 (1930). 1930. 19: 258-261, 423-425 (1931).
- MARBAKER, EDWARD E. High-test gray iron. IV. Review of literature from 1920-1928. Harvey, Ill., Whiting Corp., 1928. 8 pages. About 60 references, with annotations.
- MAURER, EDWARD, and BISCHOF, WILHELM. Zur physikalischen Chemie der Manganreaktion bei der Stahlherstellung. In *Ergebnisse der angew. physik. Chemie* 1: 160-162 (1931). 50 references.
- MÜLLER-HAUF, ALBERT. Automobile steels. New York, Wiley, 1930. 219 p. Bibl., p. 195-198.
- NEUENDORFF, G. Production of high-test cast iron. *Metals and Alloys* 1: 624-625 (1930). 44 references.
- NEWARK, N. J. *Free public library.* Steel treating; books of interest to members of the American Society for Steel Treating. 1930. 16 p.
- NORTON, FREDERICK H. The creep of steel at high temperature. New York, McGraw-Hill, 1929. 90 p. Bibl., p. 80-86.
- OEHMAN, EINAR. Om martensiten struktur, bildning och sönderfall. *Jerkontorets Annaler* 1931: 351-352. 46 references.
- OERTEL, W., and GRUTZNER, A. Die Schnelldrehstähle. Düsseldorf, Verlag Stahl Eisen, 1931. 223 p. Contains a patent list.
- PIWOWARSKY, EUGEN. Hochwertiger Grauguss und die physikalisch-metallurgischen Grundlagen seiner Herstellung. Berlin, Springer, 1929. 336 p. Bibl. footnotes.
- REMMERS, WALTER E. The permanent growth of gray cast iron. Am. Inst. Mining Met. Eng., Tech. Publ. No. 377: 10-11 (1930). 34 references.
- SATOH, SHUN-ICHI. Influence of nitrogen on special steels. Case-hardening with nitrogen. Am. Inst. Mining Met. Eng., Tech. Publ. No. 260. 1929. 19 p. Bibl., p. 18-19. 75 references. Also in Iron and Steel Div., 1930: 207-208; Heat Treating and Forging 15: 1583-1588 (1929).
- SAUERWALD, FRANZ. Lehrbuch der Metallkunde des Eisens und der Nichteisenmetalle. Berlin, Springer, 1929. 462 p. Contains bibls.

IRON AND STEEL—Cont'd

- SCHWARTZ, H. A. Malleable iron—recent progress. *Metals and Alloys* 2: 140-149 (1931). 36 footnotes.
- SCHWARZ, C. Das Schmelzern im Siemens-Martin-Ofen. In Geiger, *Handbuch der Eisen- und Stahlgießerei* 3: 287-301 (1928).
- Second report on the heterogeneity of steel ingots. *J. Iron Steel Inst.* 117: 431-437, 534-547 (1928). About 100 references.
- SOCIETY OF CHEMICAL INDUSTRY. Iron and steel. In *Reports on the progress of applied chemistry* 14: 240-268 (1929); 158 footnotes. 15: 263-292 (1930); 142 footnotes.
- STADELER, A. Beiträge zur Eisenhüttenchemie. *Stahl u. Eisen* 45: 759-765, 803-906, 1390-1394, 1432-1437, 1644-1648, 2056-2060 (1925). 185 footnotes. 46: 444-448, 812-815, 1432-1437, 1761-1765, 1798-1800 (1926). 103 footnotes. 47: 410-413, 458-459, 795-800, 1574-1577, 2082-2085, 2119-2121 (1927). 91 footnotes. 48: 79-83, 488-492, 912-914, 948-950, 1551-1554, 1752-1755 (1928). 135 footnotes. 49: 540-544, 1023-1026, 1667-1671 (1929). 83 footnotes. 50: 46-50, 521-525, 1031-1034, 1368-1372 (1930). 107 footnotes. 51: 71-76, 556-560, 889-891 (1931). 66 footnotes.
- STRAUB, FREDERICK G. Embrittlement in boilers. *Univ. Ill., Eng. Expt. Sta., Bull. No. 216.* 1930. 128 p. Bibl., p. 97-111.
- WOHRMAN, CARL R. Inclusions in iron. *Trans. Am. Soc. Steel Treating* 14: 45-46, 158-162 (1928).
- WÜST, FRITZ, and LEIHENER, OTTO. Das Wachsen von Gusseisen. *Mitt. Kaiser-Wilhelm-Institut für Eisenforschung* 10: 265-281 (1928). 35 footnotes.
- Zeitschriften und Bücherschau.* *Stahl u. Eisen* 49: 149-167, 294-308, 439-452, 583-593, 811-825, 957-972, 1098-1113, 1279-1291, 1423-1435, 1600-1613, 1739-1750, 1875-1889 (1929); 50: 137-155, 267-281, 403-415, 557-576, 774-786, 931-946, 1101-1116, 1239-1252, 1375-1385, 1536-1552, 1687-1699, 1823-1834 (1930); 51: 135-151, 266-277, 397-410, 561-573, 683-694, 802-810, 973-984, 1089-1099, 1202-1216, 1346-1356, 1511-1521, 1601-1609 (1931). Complete bibliography for these years.

Serial

Iron and Steel Institute with the co-operation of the National Federation of Iron and Steel Manufacturers. *Iron, steel and industrial fuel: Survey of current literature.* Vol. 1 +. London, 1929 +.

IRON OXIDES*

- BRUCKNER, WALTER H. The electrolytic production of turkey red iron oxide pigment. *Trans. Am. Electrochem. Soc.* 57: 147-150 (1930). 38 references and 9 patents, with brief annotations.
- DOELTER, C. Eisenglanz. In *his* *Handb. Mineralchem.* 3, pt. 2: 629-639 (1926). Bibl. footnotes.
- DOELTER, C. Magneteisen. In *his* *Handb. Mineralchem.* 3, pt. 2: 639-655 (1926). Bibl. footnotes.
- RALSTON, OLIVER C. Iron oxide reduction equilibria. A critique from the standpoint of the phase rule and thermodynamics. *U. S. Bur. Mines, Bull.* 296. 1929. 326 p. About 435 footnotes.
- SCHIKORR, G. Ueber das gelbe Eisen (III) Hydroxydsol. *Kolloid-Z.* 52: 25-31 (1930). 30 footnotes.

IRON SULFATES

- CAMERON, FRANK K. Solubility of ferrous sulfate. *J. Phys. Chem.* 34: 629-710 (1930). 90 footnotes.
- SCHARIZER, R. Die Eisensulfate. In Doelter, *Handb. Mineralchem.* 4, pt. 2: 537-591 (1929). Bibl. footnotes.

ISATIN

- COHN, G. Isatin. In *Ullmann, Enzyk. tech. Chem.*, 2nd ed., 6: 267-271 (1930). References through text. Includes derivatives.
- HELLER, GUSTAV. Ueber Isatin, Isatyd, Dioxindol und Indophenin. *Sammlung chem., chem.-tech. Vorträge, N. F.*, No. 5. 1931. 173 p. Bibl. footnotes.

ISOBORNEOL* See CAMPHOR (Ullrich).**ISOLEUCINE**

- MAHN, HERBERT. Isoleucin. In *Abderhalden, Biochem. Handl.* 12: 454-457 (1930). Bibl. footnotes.

ISOMERISM

- VAVON, G. Application à l'étude de l'isomérisie cis-trans dans les corps cycliques. *Bull. soc. chim.* 49: 1011-1015 (1931). 204 references.

ISOTOPES

- BAINBRIDGE, K. A. Isotopes of lithium, sodium and potassium. *J. Franklin Inst.* 212: 317-339 (1931). About 50 footnotes.
- GLEDITSCH, ELLEN. Contribution to the study of isotopes. *Norsk Videnskaps-Akademi i Oslo. Skrifter. I. Matematisk-Naturvidenskabelig Klasse*, 1925, No. 3. 49 p. Bibl. footnotes.
- Isotopes. In *Tables Annuelles* 6: 831 (1928); 7: 1109 (1930). 51 references.
- See also RADIUM.

KAINITE.* See POLYHALITE.

KAOLIN

SMITH, RICHARD W. Sedimentary kaolins of the coastal plain of Georgia. Georgia. Geol. Survey, Bull. No. 44. 1929. 482 p. Bibl., p. 468-474.

See also CLAYS.

KAPOK*

GRUNOW, WALTER. Der Kapok in der Weltwirtschaft. Berlin, Wilhelm Christians Verlag, 1928. 129 p. Contains a bibl.

KETONES. See ALDEHYDES (Schmidt).

KIDNEYS

LEBERMANN, FERDINAND. Ueber Nierenfunktionsprüfungen. Ergebnisse inneren Medizin u. Kinderheilkunde 35: 466-470 (1929).

POULSSON, LEIF T. Ueber die Wirkung des Pituitrins auf die Wasserausscheidung durch die Niere. Z. ges. exptl. Med. 71: 619-620 (1930). 83 references.

RICHARDS, ALFRED N. Methods and results of direct investigations of the function of the kidney. Baltimore, Williams and Wilkins, 1929. 64 p. Bibl., p. 62-64.

KIESERITE.* See POLYHALITE.

KINETICS

Chemical equilibria. In Tables Annuelles 6: 962-988 (1928); 7: 1242-1263 (1930). References through text.

CROWELL, JOYCE H. The kinetics of heterogeneous reactions and their dependence on surface and agitation. Thesis, Columbia Univ., 1930. 110 p. Bibl., p. 111-113.

GROLL, J. TEMMINCK. The kinetics of biochemical reactions. International Critical Tables VII: 158-159 (1930). 175 references.

HERZFELD, K. F., and SMALLWOOD, HUGH M. Kinetic theory of gases and liquids. In Taylor, Treatise on Physical Chemistry, 2nd ed., I: 73-250 (1931). Bibl. footnotes.

HINSHELWOOD, C. N. Chemical kinetics. In Annual reports on the progress of chemistry 24: 314-341 (1927). 122 footnotes.

HINSON, A. W., and CROMWELL, J. H. Dependence of reaction velocity upon surface and agitation. Ind. Eng. Chem. 23: 930-931 (1931). 69 references.

KORNFELD, G. Neuere Fragen der chemischen Kinetik. Z. angew. Chem. 42: 459-462 (1929). 34 references.

MOELWYN-HUGHES, EMYR A. Kinetics of the hydrolysis of certain glucosides.

Trans. Faraday Soc. 24: 309-321 (1928); 25: 81-92, 503-520 (1929). Bibl. footnotes.

Reaction velocity. In Tables Annuelles 6: 989-1040 (1928); 7: 1264-1320 (1930). References through text.

SCHWAB, GEORG-MARIA. Theoretische und experimentelle Fortschritte auf dem Gebiete der heterogenen Gasreaktionen. Ergebnisse exakt. Naturwissenschaften 7: 336-351 (1928). 254 references.

SEMENOFF, N. Kinetics of chain reactions. Chem. Reviews 6: 379 (1929). 15 references.

SKRABAL, ANTON. Chemical kinetics. International Critical Tables VII: 150-152 (1930). 565 references.

TAYLOR, HUGH S. Chemical reactions at surfaces. Chem. Reviews 9: 44-46 (1931). 85 references.

WINTHER, CHRISTIAN. Photochemical kinetics. International Critical Tables VII: 159-173 (1930). About 400 references.

KRYOLITE*

DOELTER, C. Kryolith. In his Handb. Mineralchem. 4, pt. 3: 283-316 (1930). Bibl. footnotes.

LACCASE.* See OXIDASE (Woker).

LACQUERS

BIANCHI, CALISTO. Celluloseesterlacke. Berlin, Springer, 1931. 329 p. Bibl. footnotes.

KARO, W. Die deutschen Patente über Nitrocelluloselacke. Nitrocellulose 2: 150-152, 172-173 (1931).

MAYRICH, A. Progress in the lacquer industry. Chem. Obzor 3: 180-184, 211-215, 243-249 (1928).

SCHIFFKORN, CARL. Die chemischen Vorgänge bei der Bildung und der Trocknung von Leinöllerlacken. Chem. Umschau Fette, Oele, Wachse Harze 38: 169-175, 185-191 (1931); Collegium No. 734: 287-311 (1931). 72 footnotes.

WOLFF, HANS. Oele, Harze, Lacke. Kolloid-Z. 49: 210-217 (1929). 89 footnotes.

See also NITROCELLULOSE, PAINTS.

LACTIC ACID

TANAKA, SHIZUO, and ENDO, M., Methode zur quantitativen Bestimmung der Milchsäure in den tierischen Flüssigkeiten und Geweben. Biochem. Z. 210: 141-142 (1929). 55 references.

See also FERMENTATION (Smyth).

LACTONES

OTT, ERWIN. Lactone. In Houben, Meth. org. Chem., 3. Aufl., 3: 644-687 (1930). Bibl. footnotes.

LACTOSE

- BLEYER, B., and STEINHAUSER, H. Bestimmungsmethoden für Milchezucker. *Milchwirts. Forschung* 1: 131-199 (1923). Bibl. through text.
- ZEMPLÉN, GÉZA. Lactose. *In* Abderhalden, *Biochem. Handlexikon* 13: 587-598 (1930). Bibl. footnotes.

LATERITE. See BAUXITE.**LATEX**

- ALADIN, —. Latex, Konservierung und Konzentration. *Gummi-Ztg.* 43: 1047-1049, 1105-1106 (1929). 85 patents.
- ALADIN, —. Technologie des Latex. *Gummi-Ztg.* 44: 686-688, 737-738, 837-838, 894-896, 945-946, 993-994 (1929-1930). 221 patents.
- CARRINGTON, J. H. Uses of concentrated latex. *Trans. Intern. Rubber Industry* 6: 438-452 (1931). Bibl. through text.
- DITMAR, RUDOLF. Ueber Latex-Konzentrate. *Kolloid-Z.* 55: 365-366 (1931); *Caoutchouc & Gutta-percha* 28: 15607-15608 (1931). 49 patents.
- HAUSER, ERNST A. Latex, its occurrence, collection, properties and technical applications with patent review. New York, Chem. Cat. Co., 1930. 202 p. Patent literature, p. 161-191. Several hundred footnotes.
- ROSSMAN, J. Uses of rubber latex; a survey of U. S. patents. *India Rubber W.* 81, No. 1: 63-66; No. 1: 67-68; No. 6: 65-66 (1929-1930). 72 patents. See also RUBBER.

LAUDANON*

- STOLTE, FRITZ. Laudanon, seine Wirkung und Anwendung bei gesunden und kranken, kleinen Haustieren. *Inaug.-Diss., Tierärztl. Hochschule, Berlin*, 1922. 67 p. Bibl., p. 64-67.

LEAD: Biochemistry.* See CHEMOTHERAPY.**LEAD HALIDES***

- DOELTER, C. Halogenide des Bleis. *In his* *Handb. Mineralchem.* 4, pt. 3: 164-183 (1930). Bibl. footnotes.

LEAD SULFATES

- DOELTER, C. Bleisulfate. *In his* *Handb. Mineralchem.* 4, pt. 2: 618-646 (1927). Bibl. footnotes.

LEATHER

- ACKER, W. Die Kunstlederherstellung im Spiegel der Patentliteratur. *Nitrocellulose* 2: 131-133 (1931). 41 references through text.
- BURTON, DONALD. Developments in the chemistry of leather manufacture during 1926. *Leather Trades' Year Book* 1927: 84-99. Classified abstracts.
- BURTON, D., and ROBERTSHAW, G. F. The function of oils and fats in currying, fat-liquoring, oiling-off and

chamoising. *J. Intern. Soc. Leather Trades Chem.* 13: 383-397 (1929). Bibl. through text.

- KOHL, LOUIS P. Weiss- und Sämischerbung; ein Handbuch über die Herstellung primitiver und edler Leder. Berlin, Krayn, 1929. 264 p. Bibl., p. 263-264.

PAYNE, H. J. American leathers. New York, Am. Leather Producers, Inc., 1929. 128 p. Bibl., p. 121-124.

SCHINDLER, WILHELM. Die Grundlagen des Fettlickerns. Leipzig, Sachische Verlagsges., 1930. 230 p. 402 references.

SOCIETY OF CHEMICAL INDUSTRY. Leather and glue. *In* Reports on the progress of applied chemistry 14: 425-448 (1929); 123 footnotes. 15: 487-510 (1930); 108 footnotes.

SPIERS, C. H. Bibliography of papers on the physical properties of leather. *J. Intern. Soc. Leather Trades Chem.* 14: 363-370, 410-415 (1930); 15: 61-67 (1931); *J. Am. Leather Chem. Assoc.* 25: 359-370, 396-406 (1930); 26: 187-198 (1931). About 450 references. Classified by properties.

STADLINGER, HERMANN. Die Verarbeitung von chromgaren Lederabfällen auf Leim und Düngemittel. *Chem. Ztg.* 52: 305-307 (1928). Patents through text.

WILSON, JOHN A. Chemistry of leather manufacture. New York, Chem. Cat. Co., 1929. 1181 p. in 2 vols. Bibl. at end of chapters.

See also ENZYMES (Gerngross), TANNING and TANNINS.

LECITHIN. See CHOLESTEROL, LIPOIDS.**LEUCEMIA***

OPIE, EUGENE L. Experimental study of the leucemias and lymphomata. *Medicine* 7: 96-103 (1928).

LEUCINE

MAHN, HERBERT. Leucin. *In* Abderhalden, *Biochem. Handl.* 12: 433-454 (1930). Bibl. footnotes.

LEUCOCYTES

NEUMANN, ALFRED. Ueber den gegenwärtigen Stand unsere Kenntnisse über die chemische Beschaffenheit der Leukozytengranula. *Folia Hematol.* 36: 288, 463-483 (1928). 608 references.

LEVAN*

HIBBERT, H., TIPSON, R. S., and BRAUNS, F. The constitution of levan. *Can. J. Research* 4: 238-239 (1931). 52 references.

LIGHT: Chemical action.

DHAR, N. R. The chemical action of light. London, Blackie, 1931. 512 p. Bibl. through text. Author index.

FALKENHEIM, CURT. Lichtwirkung und antirachitischer Schutzstoff in lebenden Organismus. *Jahrb. Kinderheilk., Suppl.* 19. 1929. 131 p. Bibl., p. 90-93.

RISSE, OTTO. Die physikalischen Grundlagen der chemischen Wirkungen des Lichts und der Röntgenstrahlen. *Ergebnisse Physiol.* 30: 242-244 (1930). 128 references.

See also ERGOSTEROL: IRRADIATED, PHOTOCHEMISTRY.

LIGNIN

FREUDENBERG, KARL, *et al.* Lignin, Coniferylalkohol und Saligenin. *Cellulosechemie* 12: 263-276 (1931). 55 footnotes.

FUCHS, WALTER. Die Methoden der Ligninforschung. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 11: 877-932 (1929). Bibl. footnotes.

HEUSER, EMIL. Survey of the chemistry of lignin. *Paper Trade J.* 88, no. 21: 75-78 (1929). 55 references.

HEUSER, EMIL, and ACKERMANN, WILHELM. Ueber die Acetylierung des Lignins. *Cellulosechemie* 5: 13-21 (1924). 40 footnotes.

HIBBERT, HAROLD, and SANKEY, CHARLES A. Studies on lignin and related compounds. V. Action of halogens on lignin and wood. *Can. J. Research* 4: 118 (1931). 33 references.

HILLMER, ARMIN. Die Löslichkeit von Lignin in Phenolen. *Cellulosechemie* 6: 169-187 (1925). 39 footnotes.

KÜRSCHNER, KARL. Neue Wege der Ligninchemie. *Tech. Chem. Papier- u. Zellstoff-Fabr.* 26: 53-66 (1929). 66 footnotes.

RASSOW, B., and GABRIEL, H. Ueber das Fichtenholz-Lignin. *Cellulosechemie* 12: 227-235, 249-254, 290-295, 318-320 (1931). 84 footnotes.

RUŠNEV, PETER. Ueber die Chemie des Lignins. *Centralb. gesam. Forstw.* 48: 281-294 (1923).

SANKEY, C. A., and HIBBERT, H. Kinetic study of the action of sulphurous acid on lignin and related compounds. *Can. J. Research* 5: 46-47 (1931). 50 references.

ZEMPLÉN, GÉZA. Lignocellulose und Lignin (Holzsubstanz). *In* Abderhalden, *Biochem. Handl.* 13: 183-228 (1931). Bibl. footnotes.

LIGNITE

BARKSDALE, JELKS. Lignite in Alabama. *Ala. Geol. Survey, Bull.* 33. 1929. 64 p. Bibl. footnotes.

GROSSKOPF, W. Ueber das stoffliche und morphologische Verhalten ligninreicher Nadelholzgewebe bei der Bildung von Waldhumus und Braunkohle. *Brennstoff-Chem.* 10: 167, 217 (1929). 47 references.

KIRCHHEIMER, F. Braunkohlenforschung und Pollenanalytik. *Braunkohle* 29: 462-463 (1930). 43 references.

LIME AND LIMESTONE

COWPER, A. D. Lime and lime mortars. *Dept. Sci. Ind. Research, Building Research Board, Special Rept. No.* 9. 1927. 81 p. Bibls. at end of sections, also p. 74-76.

HATMAKER, PAUL. Utilization of dolomite and high-magnesium limestone. *U. S. Bur. Mines, Information Circ.* 6524. 1931. 18 p. Bibl., p. 15-18.

O'MEARA, R. G., GOW, A. M., and SCHRENK, W. A. Compendium on limes in hydrometallurgy and flotation. *U. S. Bur. Mines, Information Circ.* 6423. 1931. 54 p. Mimeographed. 105 footnotes.

NORTH, F. J. Limestones, their origins, distribution and uses. London, Murby & Co., 1930. 467 p. Bibl. references.

ROSSMAN, J. The patent history of lime. *Rock Products* 32, no. 16: 66-72 (1929). 36 patent abstracts on quick lime.

LIMONITE

LEITMEIER, H. Limonit. *In* Doelter, *Handb. Mineralchem.* 3, pt. 2: 680-764 (1926). Bibl. footnotes.

LINSEED OIL. See OILS: DRYING, PAINTS.

LIPASE

EULER, H. v., and MYRBÄCK, K. Lipasen. Butyrasen. *In* v. Euler, *Chemie der Enzyme*, II, pt. 1: 6-64 (1928). Bibl. footnotes.

HITTMAIR, ANTON. Ueber Lymphozytenlipase. *Folia Hematol.* 41: 483 (1930). 67 references.

SCHENKER, ROBERT. Zur Kenntnis der Lipase von *Aspergillus niger* (van Tiegh.). *Biochem. Z.* 120: 194-196 (1921). 67 references.

SMORODINIZEW, J. A., and DANILOW, V. A. Der Einfluss einiger Chinin- und Harnstoffverbindungen auf die Pankreaslipase. *Biochem. Z.* 161: 178-194 (1925). 28 footnotes.

WALDSCHMIDT-LEITZ, ERNST. Lipasen. *In* Oppenheimer, *Fermente* 3: 700-725 (1929). 32 references.

See also ENZYMES (Hesse).

LIPEMIA

MILBRADT, WILHELM. Lipämienstudien. *Biochem. Z.* 223: 278-322 (1930). 137 footnotes.

LIPOIDS

DECKWITZ, RUDOLF. Lipoidantagonismen. *Ergebnisse Physiol.* 32: 822-974 (1921). Bibl. at end of each small section.

LIPIDS—Cont'd

GOLA, G. I lipidi nelle piante. *Biochim. terap. sper.* 15: 75-76 (1928). 36 references.

GORODISSKY, HENRIETTE. Zur Mikromethodik der quantitativen Bestimmung der Hirnlipide. *Biochem. Z.* 159: 393-394 (1925). 47 references.

KNAUER, HANS. Ergebnisse der Lipoidstoffwechselforschung. *Jahrb. Kinderheilkunde, Suppl.* 22. 1928. 164 p. Bibl., p. 136-145.

MAGISTRIS, HUGO. Die Lipide. *Ergebnisse Physiol.* 31: 165-187 (1931). 690 references.

OLCOVICH, H. S., and MATTILL, H. A. The unsaponifiable lipids of lettuce. I. Carotene. *J. Biol. Chem.* 91: 116-117 (1931). 31 references.

OSATO, S., and HEKI, M. Micro determination of lipids in tissues. *J. Biol. Chem.* 87: 556-557 (1930). 41 references.

TERROINE, ÉMILE F. Contribution à la connaissance de la physiologie des substances grasses et lipidiques. *Ann. sci. nat., 10th ser.,* 4: 377-394 (1920).

THIERFELDER, HANS, and KLENK, E. Die Chemie der Cerebroside und Phosphatide. Berlin, Springer, 1930. 224 p. Bibl., p. 185-216.

WESTPHAL, K., and MANN, W. Klinische Physiologie und Pathologie des Lipoidstoffwechsels. *In* Hirsch, *Handb. inneren Sekretion* 2: 1475-1480 (1929).

See also BIOCHEMISTRY (Peters and Van Slyke).

LIQUID CRYSTALS

OSEEN, C. W. Die anisotropen Flüssigkeiten. *Fortschritte Chem., Physik, physik. Chem.* 20, No. 2. 1929. 87 p. Bibl. footnotes.

OSTWALD, WOLFGANG. Ueber mesomorphe und kolloide Systeme. *Z. Krist.* 79: 221-254 (1931). Bibl. footnotes.

VORLÄNDER, D. Chemie der kristallinen Flüssigkeiten. *Z. Krist.* 79: 61-89 (1931). Bibl. footnotes.

LITHIUM

BRAUN, HANS J. Die Herstellung von Lithiummetall. *Metallbörse* 19: 2637-2639 (1929).

LIVER

GEIGER, E. Mobilisierung des Muskelglykogens durch Adrenalin und die Resynthesen der Muskelmilchsäure in der Leber. *Biochem. Z.* 223: 203-204 (1930). 40 references.

GUBSER, A. Zur Chemie der Leberverfettung. *Biochem. Z.* 198: 80 (1928). 27 references.

HURST, E. W., and HURST, P. E. Experimental liver cirrhosis. *J. Path. Bact.* 31: 340-342 (1928). 66 references.

JEZLER, ADOLF. Beitrag zur funktionellen Leberdiagnostik. *Z. klin. Med.* 111: 70 (1929). 58 references.

KAPFFHAMMER, J. Die Leber im Stoffwechsel. *In* Oppenheimer, *Handb., Biochem.,* 2nd ed., 9: 98-153 (1927). 363 footnotes.

KUHNAU, J. Ueber den Abbau der β -Oxybuttersäure durch Fermente der Leber. *Biochem. Z.* 200: 59-60, 80 (1928). 160 references.

LUBRICATING OILS

ASCHER, R. Die Schmiermittel. 2. Aufl. Berlin, Springer, 1931. 302 p. Bibl. of books, p. 294-295. Numerous footnotes.

BÜCHE, WILLI. Untersuchungen über molekular-physikalische Eigenschaften der Schmiermittel und ihre Bedeutung bei halbflüssiger Reibung. *Petroleum* 27: 600-601 (1931). 46 references.

BUREAU OF STANDARDS. Publications relating to friction and lubrication. *Letter Circ.,* No. 271. 4th ed. 31 p. 1931.

CLARKE, R. W. L. Lubricants (1928-1929). *J. Inst. Petroleum Tech.* 18: 255-265 (1930). 53 footnotes.

ETTELE, CLAUDE. Lubricating oil salesman's primer. 3d ed. Easton, Chem. Publ. Co., 1931. 118 p. Contains bibls.

HERSEY, MAYO D. Lubrication research. *Mech. Eng.* 52: 773-774 (1930). 40 references.

KARPLUS, HANS. Der Aufbau der Schmierschicht und die Kolloid-graphitschmierung. *Petroleum* 25: 375-386 (1929). 31 footnotes.

Lubrication research activities. Fifth Report of A. S. M. E. Special Research Committee on Lubrication. 1930. 113 references.

NASH, A. W., and BOWEN, A. R. The principles and practice of lubrication. London, Chapman and Hall, 1929. 315 p. Bibl., p. 306-307.

NASH, A. W., STANLEY, H. M., and BOWEN, A. R. Synthetic lubricating oils. *J. Instn. Petroleum Tech.* 16: 856-857 (1930). 81 references.

SINGER, LEOPOLD. Emulgierte und verseifte Oele. Motorentrieb und Maschinen-Schmierung 11, no. 1: 6-8; no. 2: 4-5; no. 3: 8-9; no. 5: 7-10; no. 6: 9-10 (1929). 109 references. Issued as supplement to *Petroleum*.

SULLIVAN, F. W., JR., *et al.* Synthetic lubricating oils. Relation between chemical constitution and physical properties. *Ind. Eng. Chem.* 23: 610-611 (1931). About 150 references and patents.

WALTHER, C. Schmiermittel. Dresden, Steinkopff, 1930. 144 p. Patents, p. 131-133. Several hundred footnotes.

LUCIFERASE *

HARVEY, E. NEWTON. Ueber Luciferase von leuchtenden Tieren. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 1: 827-853 (1930). *Bibl. footnotes.*

LUMINESCENCE

DANCKWORTT, PETER W. Lumineszenz-Analyse im filterierten ultravioletten Licht. 2. Aufl. Leipzig, Akad. Verlagsges., 1929. 147 p. *Bibl.*, p. 121-136.

LUNGS

LILJESTRAND, G. Chemismus des Lungengaswechsels. *In* *Handbuch der normalen und pathologischen Physiologie* 2: 190-229 (1925). *Bibl. footnotes.*

LYMPH

WIRTH, O. Ueber die biologische Wirkung von Lymphdrüsenextrakt auf Organe glatter Muskulatur, auf das Herz und den Blutdruck. *Biochem. Z.* 132: 245-269 (1922). 87 footnotes.

LYSINE

MAHN, HERBERT. Lysin. *In* Abderhalden, *Biochem. Handl.* 12: 543-557 (1930). *Bibl. footnotes.*

MAGNESIUM

PICCARDI, G. Sulla reazione magnesio-acqua ad alta temperatura. *Gazz. chim. ital.* 60: 337-351 (1930). 44 footnotes.

See also CORROSION.

MAGNESIUM CARBONATE

BRAUNMÜHL, HERMANN VON. Ueber die Entstehung der Lagerstätten dichten Magnesits vom Typus Krauth. *Archiv für Lagerstättenforschung*, No. 45. 87 p. *Bibl.*, p. 83-87.

TYLER, PAUL M. Magnesite. U. S. Bur. Mines, *Information Circ.* 6437. 1931. 53 p. Mimeographed. *Bibl. of deposits*, p. 45-51.

See also IRON OXIDES (Ralston).

MAGNESIUM SULFATE

JANECKE, ERNST. Bittersalz, Hexahydrat, Kieserit, etc. *In* Doelter, *Handb. Mineralchem.* 4, pt. 2: 19-34 (1926). *Bibl. footnotes.*

MALIC ACID. *See* PLANTS: COMPOSITION.

MALTASE

BAMANN, EUGEN. Maltase. *In* Oppenheimer, *Fermente*, 3: 855-867 (1929). 35 footnotes.

See also AMYLASE, ENZYMES (Hesse)

MALTOSE

ZEMPLÉN, GÉZA. Maltose. *In* Abderhalden, *Biochem. Handl.* 13: 566-582 (1931). *Bibl. footnotes.*

MANGANESE: Ores.

HEALEY, M. V., and JOHNS, A. L. Selected bibliography and map of manganese deposits of the United States by districts. U. S. Bureau of Mines, *Information Circ.* 6274. 1930. 19 p. *Bibl.*, p. 14-19. 55 references.

LEITMEIER, H. Die Lagerstätten oxydischer Manganerze und ihre Entstehung. *In* Doelter, *Handb. Mineralchem.* 3, pt. 2: 909-965 (1926). *Bibl. footnotes.*

MANGANESE OXIDES

KOEHLIN, R. Gruppe der Manganoxys und Manganhydroxyde. *In* Doelter, *Hand. Mineralchem.* 3, pt. 2: 839-909 (1926). *Bibl. footnotes.*

MANNITOL

ZEMPLÉN, GÉZA. Mannit. *In* Abderhalden, *Biochem. Handl.* 13: 713-720 (1931). *Bibl. footnotes.*

MANNOSE

ZEMPLÉN, GÉZA. Mannose. *In* Abderhalden, *Biochem. Handl.* 13: 445-457 (1931). *Bibl. footnotes.*

MARBLE

BOWLES, OLIVER, and BANKS, D. M. Marble. U. S. Bur. Mines, *Information Circ.* 6313. 1930. 20 p. *Bibl.*, p. 19-20.

MARL. *See* GREENSAND.

MEAT INSPECTION *

DEDIEU, PAUL. La saisie des viandes dans les abattoirs et tueries. Paris, Vigot frères, 1931. 191 p. *Bibl. footnotes.*

MEAT PRODUCTS

MOULTON, CHARLES R. Meat through the microscope; applications of chemistry and the biological sciences to some problems of the meat packing industry. Chicago, Univ. Chicago Press, 1929. 528 p. *Bibl.* at end of each chapter except the first.

SCOTT, EVERETT L. The influence of the growth and fattening processes on the quantity and quality of meat yielded by swine. Thesis, Purdue Univ., 1930. 105 p. *Bibl.*, p. 64-67.

MELANIN

BLOCH, BR., and SCHAFF, F. Pigmentstudien. *Biochem. Z.* 162:205-206 (1925).

PERCIVAL, G. H., and STEWART, C. P. Melanogenesis. *Edinburgh Med. J.* 37:522-523 (1930). 30 references.

MELEZITOSE

ZEMPLÉN, GÉZA. Melezitose. In *Abderhalden, Biochem. Handl.* 13:620-622 (1931). *Bibl. footnotes.*

MELLITE *

SCHMID, LEOPOLD. Mellit. In *Doelter, Handb. Mineralchem.* 4, pt. 3:805-810 (1931). 158 references.

MELTING POINTS

GELLER, A. Das Schmelzen von Salzen bei hohen Drucken in seiner Bedeutung für den Vorgang der Salzmetamorphose. *Fortschritte Mineral., Kryst., Petrog.* 14:164-166 (1930). 135 references.

Melting points. In *Tables Annuelles* 7:163-195 (1930); 8:188-230 (1931). *References through text.*

MEMBRANES

DONNAN, F. G. Short résumé of investigations on membrane equilibria and membrane potentials. *Nat. Research Council, Bull.* 69:53-55 (1929). 45 references.

MICHAELIS, LEONOR. Molecular sieve membranes. *Nat. Research Council, Bull.* 69:140-141 (1929). 37 references.

MENTHONE

HIRAIDZUMI, TEIKICHI. Studies in menthones. *Anniv. Vol. to Masumi Chikashige*, 1930:109-110. 46 references.

READ, JOHN. Recent progress in the menthone chemistry. *Chem. Reviews* 7:48-50 (1930). 73 references.

MERCAPTANS

MAILISOFF, WM. M., MARKS, ERNEST M., and HESS, FRED G. Study of mercaptan chemistry. *Chem. Reviews* 7:534-547 (1930). About 550 references.

MERCERIZATION

CLAROU, J. Les agents mouillants dans le bain de mercerisage. *Tiba* 8:281, 283, 403-407, 533-537 (1930). Patent review.

SEDLACZEK, —. Netzmittel in Mercerisierbädern. *Z. ges. Textil-Ind.* 32:505-508 (1929). Patents through text.

MERCURY

SPÄTH, ERNST. Quecksilber. In *Doelter, Handb. Mineralchem.* 3, pt. 2:325-358 (1926). *Bibl. footnotes.*

MERCURY: Analytical.

DUNNICLIFF, H. B., and SURI, H. D. Volumetric determination of mercury. *Analyst*: 54:405-410 (1929). *References through text.*

METABOLISM

ABELIN, J. Wirkung der proteinogenen Amine auf den Gaswechsel. *Biochem. Z.* 101:197-238 (1920). 35 footnotes.

ALBRIGHT, F., BAUER, W., and AUB, J. C. Influence of the thyroid gland and the parathyroid hormone on the total acid base metabolism. *J. Clin. Investigation* 10:217-219 (1931). 32 references.

ARMBRUSTER, L. Nahrung, Verdauung und Stoffwechsel der Bienen. In *Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere* 3:557-563 (1931). 279 references.

BACQ, Z. M. Contribution à l'étude de l'influence des glandes sexuelles sur le métabolisme. *Ann. physiol. physicochim. biol.* 5:703-708 (1929).

BAUER, W., ALBRIGHT, F., and AUB, J. C. Calcium excretion of normal individuals on a low calcium diet. *J. Clin. Investigation* 7:94-96 (1929). 41 references.

BERTRAM, F. Lävulose und Dextrose im intermediären Stoffwechsel. *Z. ges. exptl. Med.* 64:301-302 (1929). 41 references.

BRULL, LUCIEN. Contribution à l'étude de l'état physico-chimique des constituants minéraux et de glucose plasmatiques. Liège, H. H. Vaillant-Carmann, 1930. *Bibl.*, p. 231-236. Thesis, Univ. Liège.

BURR, G. O., and BURR, M. M. Nature and rôle of the fatty acids essential in nutrition. *J. Biol. Chem.* 86:619-621 (1930). 45 references.

CORT, CARL F. Mammalian carbohydrate metabolism. *Physiol. Rev.* 11:252-275 (1931). 456 references.

DEIGHTON, THOMAS. Study of the metabolism of two breeds of pigs. *J. Agr. Sci.* 19:182-184 (1929). 38 references.

DUBOIS, EUGENE F. Recent advances in the study of basal metabolism. *J. Nutrition* 3:227-228, 342-343 (1930). 113 references.

DURIG, ARNOLD. Energiewechsel. In *Jahresber. Physiol. exptl. Pharmacol.* 3:184-191 (1922); 5:234-250 (1924); 7:308-332 (1926); 9:233-272 (1928). *Bibl. footnotes.*

FARQUHARSON, R. F., *et al.* Calcium and phosphorus metabolism. *J. Clin. Investigation* 10:248-249, 267-269, 284-286 (1931). 89 references.

- FISCHER, F. P. Ernährung und Stoffwechsel der Gewebe des Auges. Ergebnisse Physiol. 31: 507-516 (1931).
- GOTTSCHALK, ALFRED. Anomalien des Eiweissabbaues. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 853-891 (1925). 268 footnotes.
- HÄNDEL, MARCEL. Ueber den Einfluss der Salze auf den Stoffwechsel. I. Die Beeinflussung des respiratorischen Gaswechsels. Biochem. Z. 146: 436-437 (1924). 43 references. II. Blutzucker und Leberglykogen. *Ibid* 146: 445. 23 references.
- HEIANZAN, N. Die Wirkung des Ca und Na auf die Leberfunktion in Bezug auf den Zuckerstoffwechsel. Biochem. Z. 165: 88-89 (1925). 59 references.
- HORST, K., MENDEL, L. B., and BENEDICT, F. G. Metabolism of the albino rat during prolonged fasting. J. Nutrition 3: 177-200 (1930). 53 footnotes.
- HUNTER, DONALD. Metabolism of calcium and phosphorus and the parathyroids in health and disease. Quart. J. Med. 24: 442-446 (1931).
- JOHANSSON, J. E. Methodik des Energiestoffwechsels. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 9: 331-366 (1924). Bibl. footnotes.
- KAPFFHAMMER, J. Stoffwechsel und Ernährung. In Jahresber. Physiol., exptl. Pharmacol. 3: 167-183 (1922); 5: 189-215 (1924); 7: 333-352 (1926); 9: 287-308 (1928). Bibl. footnotes.
- KREBS, H. A., *et al.* Allgemeine Methoden des Stoff- und Energiwechsels. In Péterfi, Methodik der wissenschaftlichen Biologie, II: 1084, 1110-1111, 1163-1164 (1928).
- KREHL, LUDOLF. Entstehung, Erkennung und Behandlung innerer Krankheiten. I. Band. Pathologische Physiologie. 13. Aufl. Leipzig, Vogel, 1930. 686 p. Bibl. footnotes.
- LABBÉ, MARCEL. Le métabolisme basal. Paris, Masson, 1929. 343 p. Contains bibls.
- MACLEOD, J. J. R. Der Brennstoff des Lebens. Ergebnisse Physiol. 30: 408-411 (1930).
- MANGOLD, ERNST. Schilddrüse und pränotable Stickstoffsteigerung beim Hungertier. Biochem. Z. 168: 178-186 (1926). 40 footnotes.
- MORGAN, AGNES FAY. Effect of heat upon the biological value of cereal proteins and casein. J. Biol. Chem. 90: 792 (1931). 33 references.
- Nahrung und Ernährung. In Jahresber. Physiol., exptl. Pharmacol. 1: 546-554; 2: 204-232; 3: 804-835; 4: 237-276; 5: 1090-1124; 6: 315-347; 7: 1205-1240; 8: 177-207; 9: 1032-1066; 10: 170-209 (1920-1929). Extensive bibl. for these years.
- NEUBERG, J. Der Stoffwechsel der Benzoesäure im menschlichen Organismus. Biochem. Z. 145: 272-273 (1924). 55 references.
- RAPPORT, DAVID. The interconversion of the major foodstuffs. Physiol. Rev. 10: 452-472 (1930).
- SAYLE, MARY H. Metabolism of insects. Quart. Rev. Biol. 3: 552-553 (1928). 36 references.
- SIMONSON, E. Der heutige Stand der Physiologie des Gesamtstoffwechsels. Ergeb. Hygiene, Bakteriell., Immunitätsforschung u. exptl. Therapie 9: 554-563 (1928).
- SJOLLEMA, B. Neues auf dem Gebiete der Tierernährung und der Fortpflanzung. Z. Tierzücht., Züchtungsbiol. Tierernähr. 5: 30-31, 50, 73-74 (1926). 97 references.
- SMITH, ARTHUR H., and MENDEL, LAFAYETTE B. Praktisches Verfahren bei Ernährungsversuchen. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 13: 117-172 (1930). Bibl. footnotes.
- Stoff- und Energiwechsel. In Jahresber. Physiol., exptl. Pharmacol. 1: 554-586; 2: 259-296; 3: 839-886; 4: 276-335; 5: 1124-1184; 6: 347-403; 7: 1240-1299; 8: 207-247; 9: 1066-1104; 10: 209-248 (1920-1929). Extensive bibl. for these years.
- Stoffwechsel. In Jahresber. wiss. Biol. 1: 223-269; 2: 199-232; 3: 204-242; 4: 221-264 (1926-1929). Covers references from about 1600 journals.
- SUPNIEWSKI, J. Der Stoffwechsel der zyklischen Verbindungen bei *Bacillus pyocyaneus*. Biochem. Z. 146: 535 (1924). 36 references.
- TERROINE, EMILE F. Le métabolisme de base: physiologie, pathologie. Paris, Les Presses Univ. France, 1925. 187 p. Bibl., p. 75-80.
- THANNHAUSER, S. J. Lehrbuch des Stoffwechsels und der Stoffwechselkrankheiten. Munich, Bergmann, 1929. 741 p. Proteins, p. 145-150; 327 references. Nucleic acids, p. 237-241; 281 references. Carbohydrates, including diabetes mellitus, p. 458-467; 510 references. Fats, p. 484-485; 72 references. Lipoids, p. 491-492; 29 references. Cholesterol, p. 508-509; 67 references. Blood and bile pigments, p. 555-558; 190 references. Minerals and water, p. 636-641; 320 references. Vitamins, p. 693-695; 78 references. Hormones, p. 714-715; 108 references.

METABOLISM—Cont'd

- UNGERER, E. Harnstoff und Glykokoll als Eiweissersatz in Versuchen an Milchziegen. *Biochem. Z.* 147: 275-355 (1924). 95 footnotes.
- WANG, CHI CHE, and HAWKS, JEAN E. Recent advancements in the study of basal metabolism in health and disease. *J. Am. Dietetic Assoc.* 5: 87-101, 184-197 (1929). 201 references.
- WELLS, H. G. Uric acid metabolism and gout. In *his* Chemical Pathology, 5th ed., 716-734 (1925). 102 footnotes.
- WESSON, L. G. Metabolic rate and respiratory quotients of rats following the ingestion of dextrin and during fasting. *J. Nutrition* 3: 516-518 (1931). 60 references.
- WHETHAM, MARGARET D. Origin of acetaldehyde in bacterial and animal metabolism. *Australian J. Exptl. Biol. Med. Sci.* 4: 53-56 (1927). 97 references.
- WUNSCH, H. H. Nahrung, Verdauung und Stoffwechsel des Fische. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztier 3: 653-659 (1931). 248 references.
- See also BIOCHEMISTRY (Meyerhof; Peters and Van Slyke); CARBOHYDRATES: METABOLISM, FATS: PHYSIOLOGICAL, FOODS: SPECIFIC-DYNAMIC ACTION, PROTEINS: METABOLISM, ETC.
- METABOLISM: Abnormal.**
- BACHER, STEPHEN, and KOSIAN, MAG. MARIA. Der Eiweissaufbau, insbesondere das Globulin-Albuminverhältnis (Eiweissquotient) in Immuneris. *Biochem. Z.* 145: 343-344 (1924). 44 references.
- V. BERGMANN, G., and STROEBE, P. Gesamtstoffwechsel unter pathologischen Bedingungen. Die Kastration. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 599-614 (1927). 75 footnotes.
- BERNHARDT, H. Pathogenesis of obesity and the problem of basal metabolism. *Endocrinology* 14: 224-225 (1930). 69 references.
- BICKEL, ADOLF. Das Wesen der Avitaminose. *Biochem. Z.* 146: 519-521 (1924). 57 references.
- COLLAZO, J. A., and SUPNIEWSKI, J. Ueber den Einfluss des Insulins und einiger anderer Stoffe auf den Milchsäurestoffwechsel. *Biochem. Z.* 154: 423-443 (1924). 46 footnotes.
- GIAJA, G. Le métabolisme de sommet. *Compt. rend. soc. biol.* 101, Réunion plénière: 21-23 (1929). 38 references.
- GORER, P. A. Physiology of hibernation. *Biol. Rev. Cambridge Phil. Soc.* 5: 228-230 (1930).
- GRAFE, ERICH. Die Krankheiten des Stoffwechsels und ihre Behandlung. Berlin, Springer, 1931. 519 p. Bibl. footnotes.
- HANKE, M. T. Rôle of diet in the cause, prevention and cure of dental diseases. *J. Nutrition* 3: 450-451 (1931). 26 references.
- HIRSCH, R. Stoffwechsel bei endokrinen Störungen. Thyreoidea und Adrenalsystem. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 615-661 (1927). 153 footnotes.
- HUNSCHER, HELEN A. Metabolism of women during the reproductive cycle. II. Calcium and phosphorus utilization in two successive lactation periods. *J. Biol. Chem.* 86: 55-57 (1930). 42 references.
- JAHN, D. Gasstoffwechsel bei Stoffwechselerkrankungen. *Z. innere Med.* 52: 1118 (1931). 48 references.
- JOYET-LAVERGNE, PH. Métabolisme et sexualité. *Protoplasma* 7: 461-463 (1929). 45 references.
- LINDER, G. C., and HARRIS, C. F. Calcium and phosphorus metabolism in chronic diarrhoea with tetany. *Quart. J. Med.* 23: 210-211 (1930). 49 references.
- MACY, I. C., HUNSCHER, H. A., NIMS, B., and MCCOSH, S. S. Metabolism of women during the reproductive cycle. I. Calcium and phosphorus utilization in pregnancy. *J. Biol. Chem.* 86: 33-35 (1930). 57 references.
- MONCEAUX, R. Troubles des échanges nutritifs dans la tuberculose pulmonaire. Saint-Cloud, Girault, 1929. 446 p. Bibl., p. 405-436.
- NARINS, SIDNEY A. A quantitative study of the effect of chloroform on oxygen consumption of the tadpole. *Physiol. Zool.* 3: 537-538 (1930). 23 references.
- Obesity, metabolism in. *Index-Cat., S. G. O., 3rd ser.*, 8: 363 (1929).
- PERITZ, G. Stoffwechsel bei endokrinen Störung. Hypophyse und Keimdrüsen. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 652-664 (1927). 43 footnotes.
- PERITZ, G. Stoffwechsel bei Nerven- und Geisteskrankheiten. In Oppenheimer, Handb. Biochem., 2nd ed., 7: 665-690 (1927). 128 footnotes.
- Pregnancy, metabolism in. *Index-Cat., S. G. O., 3rd ser.*, 8: 1154-1555 (1929).
- SLATER, W. K. Anaerobic life in animals. *Biol. Rev. Cambridge Phil. Soc.* 3: 327-328 (1928). 70 references.
- STRANG, J. M., and MCCLUGAGE, H. B. The specific dynamic action of food in abnormal states of nutrition. *Am. J.*

Med. Sci. 182:80-81 (1931). 26 references.

TSCHERKES, L. Kalorische und qualitative Eigenschaften von Ernährungsregimen bei Versuchen mit experimenteller Avitaminose. *Biochem. Z.* 143:9 (1923). 36 references.

WELLS, H. G. Gastro-intestinal "auto-intoxication" and related metabolic disturbances. In *his* Chemical Pathology, 5th ed., 655-683 (1925). 193 footnotes.

WELLS, H. G. Pathological conditions due to or associated with abnormalities in metabolism. In *his* Chemical Pathology, 5th ed., 601-654 (1925). 391 footnotes.

WESSON, LAURENCE G., and BURR, GEORGE O. Metabolic rate and respiratory quotients of rats on a fat-deficient diet. *J. Biol. Chem.* 91:538-539 (1931). 40 references.

METABOLISM: Mineral.*

KLINKE, KARL. Der Mineralstoffwechsel. Physiologie und Pathologie. Leipzig, Deuticke, 1931. 298 p. 2064 references at end of the several chapters.

LINTZEL, W. Der Mineralstoffwechsel. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere 3:342-352 (1931). 1001 references.

METALLO-ORGANIC COMPOUNDS

See ORGANO-METALLIC COMPOUNDS.

METALLOGRAPHY

BENEDICKS, CARL. Colloid systems in metallography. In Alexander, Colloid Chemistry III:458 (1931). 38 references.

METALLURGY

AMERICAN SOCIETY OF MECHANICAL ENGINEERS. A bibliography on effect of temperature on properties of metals. New York, The Society, 1928. 27 p. Supplement. 1931. 27 p. 562 references. Chronological with author index. Annotated. The supplement also contains 52 references on "Oxidation of metals at high temperatures."

BAUER, O., and HANSEN, M. Der Einfluss von dritten Metallen auf die Konstitution von Messinglegierungen. *Z. Metallkunde* 21:145-151, 190-196 (1929). 48 footnotes.

BAUER, O., and HANSEN, M. Der Einfluss von dritten Metallen auf die Konstitution für Messinglegierungen. II. Der Einfluss von Nickel. *Z. Metallkunde* 21:367 (1929). 31 references.

BOYLSTON, H. M. Fifty years of physical metallurgy. *Metals and Alloys* 1:329-331 (1930). 58 references.

BRAY, JOHN L. The principles of metallurgy. Boston, Ginn, 1929. 568 p. Bibl. at end of each chapter.

DEAN, R. S. Bibliography of the metallurgical work of the U. S. Bureau of Mines in 1930. U. S. Bur. Mines, Information Circ. 6449. 1931. 7 p.

DEHLINGER, U. Zur Theorie der Rekristallisation reiner Metalle. *Ann. Physik* 2:791-793 (1929). 40 references.

GILLET, H. W. Testing deep drawing qualities of sheet metal. *Metals and Alloys* 2:222 (1931). 65 references.

HÄGG, G. Theoretical and practical foundation of nitriding. *Jernkontorets Annaler* 1931:207-208. 35 references.

HENTZE, ERNST. Sintern, Schmelzen und Verblasen sulfidischer Erze und Hüttenprodukte. Berlin, Springer, 1929. 405 p. Bibl. footnotes.

HOLLABAUGH, C. B., and DAVEY, W. P. Preferred orientation produced by cold rolling in the surface of sheets of aluminum, copper and silver. *Metals and Alloys* 2:312 (1931). 49 references.

JOSEPH, T. L., and BARRETT, E. P. Resistance of iron ores to decrepitation and mechanical work. *Am. Inst. Mining Met. Eng., Tech. Publ. No.* 372. 1930. 15 p. Bibl., p. 12-15. 53 references.

KOTHNY, E. Legierter Guss. *Giesserei-Ztg.* 27:299-300, 326-327 (1930). 126 references.

MCCombs, LOIS F. Supplementary bibliography on effect of temperature on properties of metals. *Proc. Am. Soc. Testing Materials*, 1931. 587 references, chronological and annotated with author index. *Cf. Ibid.* 24, pt. II:128-141 (1924).

Metallurgy. In *Tables Annuelles* 6:1605-1672 (1928); 7:1811-1896 (1930). References through text.

NAISH, W. A., and CLENNELL, J. E. Select methods of metallurgical analysis. London, Chapman and Hall, 1929. 495 p. Contains bibliographies.

O'NEILL, HUGH. Hardness and its relation to the cold working and machining properties of metals. *Iron and Steel Inst., Carnegie Scholarship Mem.* 15:278-279 (1926); 17:155-156 (1928). 111 references.

RICKARD, T. A. The early use of the metals. *J. Iron Steel Inst.* 43:336-339 (1930). 130 references.

RIMBACH, RICHARD. Research in metallurgical literature. *Blast Furnace Steel Plant* 14:396-399 (1926).

SAEGER, C. M., JR., and ASH, E. J. Methods for determining the volume

METALLURGY—Cont'd

changes undergone by metals and alloys during casting. *Trans. Am. Foundrymen's Assoc.* 38: 107-145 (1930). 40 footnotes.

SATO, SHUN-ICHI. Influence de l'azote sur les aciers spéciaux et expériences sur la nitruration. *Rev. métal.* 26: 257-258 (1929). 73 references.

SAUERWALD, FRANZ. *Lehrbuch der Metallkunde.* Berlin, Springer, 1929. 462 p. Bibl. through text.

SAUERWALD, FRANZ. *Physikalische Chemie der metallurgischen Reaktionen.* Berlin, Springer, 1930. 142 p. Bibl. footnotes.

SCHÜZ, EMIL. *Der Temperguss.* Berlin, Springer, 1930. 390 p. Bibl., p. 373-378.

SKAUPY, FRANZ. *Metallkeramik.* Berlin, Verlag Chemie, 1930. 60 p. Bibl. footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Non-ferrous metals. *In Reports on the progress of applied chemistry* 14: 269-294 (1929); 165 footnotes. 15: 293-315 (1930); 146 footnotes.

STOUGHTON, BRADLEY, and BUTTS, ALISON. *Engineering metallurgy.* 2d ed. New York, McGraw-Hill, 1930. 498 p. Bibl. at end of most of the chapters.

WEVER, F., and SCHMID, W. E. *Textur kaltverformter Metalle.* *Z. Metallkunde* 22: 140 (1930). 39 references.

Serial

Bulletin of the British Non-Ferrous Metals Research Association. Contains "Advances in non-ferrous metals research and industry."

Metals and Alloys. 1+. 1929+. Each number contains "Current metallurgical literature abstracts."

METALS

AGTE, CURT, and BECKER, KARL. Ueber die Zusammenhänge zwischen der Aenderung des physikalischen Eigenschaften durch Kaltbearbeitung und Mischkristallbildung und ihre Deutung. *Physik. Z.* 32: 79-80 (1931). 75 references.

ALEXANDER, JEROME. The colloidal state in metals and alloys. *In his Colloidal Chemistry* III: 437-438 (1931). 61 references.

ALTERTHUM, H. Die Entwicklung auf dem Gebiete der temperaturbedingten Kristallstrukturänderung von homogenen festen Metallen. *Physik. Z.* 32: 325-326 (1931). 105 references.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Effect of temperature on the properties of metals. 1930. 2 vols. Vol. 1, 300 references, 1828-1927; Vol. 2, 250 references, 1927-1930.

LIESEGANG, R. E. *Metalle.* *Kolloid-Z.* 49: 332-343 (1929). 120 references.

McCOMB, LOIS F. Bibliography of effect of temperature on metals. *In Symposium on effect of temperature on the properties of metals* (A. S. T. M.) 1931: 567-613. Chronological.

SCHMID, ERICH, and WASSERMANN, GÜNTER. Wachstums und Deformationstexturen der Metalle. *In Auerbach and Hort, Handb. physik. tech. Mechanik* 4, pt. 2: 319-351 (1931). Bibl. footnotes.

SEEMAN, H. J. Metallographische Strukturverwandtschaftslehre. *Z. tech. Physik* 9: 233-240 (1928). 50 footnotes.

SEEMAN, H. J. Magnetochemie der diamagnetischen Metalle und Legierungen. *Z. tech. Physik* 10: 399-408 (1929). 65 footnotes.

TAMMANN, G. Zur Theorie der Rekristallisation. *Z. anorg. allgem. Chem.* 185: 1-34 (1929). Bibl. footnotes.

METALS: Biochemistry. *See* NUTRITION (Rose), PLANTS: COMPOSITION (Miller), PLANTS: METABOLISM (LeVan), ZINC: BIOCHEMISTRY.

METALS: Fatigue.

CAZAUB, R. La fatigue des métaux. *Aciers spéciaux* 4: 427-428 (1929). 23 references.

Present-day experimental knowledge and theories of fatigue phenomena in metals. *Proc. Am. Soc. Testing Materials* 30, pt. I: 305-310 (1930). 117 references.

METALS: Oligodynamic action.

BORTELS, HERMANN. Ueber die Bedeutung von Eisen, Zink und Kupfer für Mikroorganismen. *Biochem. Z.* 182: 357-358 (1927). 73 references.

GORDIANI, M. I concimi oligodinamici. *Giorn. chim. ind. appl.* 12: 575-579 (1930). 48 footnotes.

HORELLI, V. Ueber die Oligodynamie der Elemente bei Mykobakterien. *Acta Soc. Med. Fennicae "Duodecim"* 13A, No. 5. 1930. 152 p. Bibl., p. 138-145.

See also COPPER: BIOCHEMISTRY.

METALS: Testing.*

CLAUS, WILLI. Das Betriebslaboratorium der Metallgiessereien und verwandter Betriebe. Halle, Knapp, 1929. 88 p. Bibl., p. 84-86.

FINK, W. L., and ARCHER, R. S. Radiography as a tool in the metal industry. *Trans. Am. Soc. Steel Treating* 16: 586-590 (1929).

GOERENS, B., and MAILÄNDER, R. Technische Verfahren zur Untersuchung der Metalle und Legierungen. In *Wien and Harms, Handb. Experimentalphysik V*: 139-633 (1930). Bibl. footnotes.

HANKINS, G. A. Hardness and abrasion testing of metals with special reference to the work done during the period 1917-1927. *Proc. Inst. Mech. Eng.*, No. 2: 353-373 (1929).

HESSENBRUCH, W. Procédé rapide amélioré pour la détermination des gaz dans les métaux, en particulier de l'oxygène dans l'acier. *Rev. métal.* 26: 111-114 (1929); *Arch. Eisenhüttenwesen* 1: 601-603 (1928). 147 references.

SACHS, G. Bedeutung der heutigen Kenntnisse plastischer Verformungsfähigkeit für die Metallprüfung. *First Comm. New Intern. Assoc. Testing Materials, Group A*: 312-313 (1930). 60 references.

METHANE

DUBOIS, JOSEF. Liquefaction of methane according to recent investigations. *Przemysl Chem.* 14: 302-309 (1930). Patent and periodical references.

See also MINE GASES.

METHANOL

BUGGE, G. Methanol. In *Ullmann, Enzyk. tech. Chem.*, 2nd ed., 7: 536-552 (1931). Patents on synthesis, 539-540, 542-548.

MCCORD, CAREY P. Toxicity of methyl alcohol following skin absorption and inhalation. *Ind. Eng. Chem.* 23: 935-936 (1931). 39 references. The author has a bibl. of 404 references available to interested parties.

MICA

GUIMARÃES, DJALMA. Aspectos economicos da mica. *Brazil, Servico geologico e mineralogica, Bol. No. 43.* 1929. 34 p. Bibl. at end.

MOHR, H. Der Nutzglimmer; *Natur, Vorkommen, Gewinnung, Verwendung.* Berlin, Borntraeger, 1930. 275 p. Bibl., p. 237-248.

SPENCE, H. S. Mica. *Canada, Dept. Mines, Mines Branch, No. 701.* 1929. 142 p. Patents relating to mica and mica products, p. 121-132.

See also TOURMALINE.

MICROCHEMISTRY. See ANALYTICAL CHEMISTRY: MICRO METHODS.

MICROSCOPY

BELLING, JOHN. The use of the microscope. New York, McGraw-Hill, 1930. 315 p. Bibl., p. 292-301.

BENEDICT, H. C. The polarizing microscope in organic chemistry. *Ind. Eng. Chem., Anal. Ed.*, 2: 92-93 (1930). 32 references.

CHAMOT, EMILE M., and MASON, CLYDE W. Handbook of chemical microscopy. Vol. I. New York, Wiley, 1930. 474 p. Bibl. footnotes. Books, p. 448-449. Vol. II. Chemical methods and inorganic qualitative analysis. 1931. 401 p.

LINDSLEY, LUTHER C. Industrial microscopy. Richmond, Va., Byrd Press, 1929. 286 p. Contains bibls.

ROMEIS, BENNO. *Taschenbuch der mikroskopischen Technik.* 12. Aufl. München, Oldenbourg, 1928. 717 p. Bibl., p. 617-663.

See also STAINS and STAINING.

MILDEWPROOFING *

FARGHER, R. G., *et al.* Inhibitory action of certain substances on the growth of mould fungi. *J. Textile Inst.* 21: 259-260T (1930). 40 references.

MILK

BARTOLUCCI, ALFREDO. Produzione, approvvigionamento e controllo igienico del latte. Milan, Istituto sieroterapico milanese, 1929. 541 p. Bibl., 517-519.

BAUER, J. Haptine und Antigen der Milch. In *Winkler, Handbuch der Milchwirtschaft* 1, pt. 1: 132-138 (1930).

CATTELAÏN, E., and BLIECQ, L. Des methodes actuellement utilisées pour caracteriser le mouillage des laits, et en particulier de la constante moleculaire simplifiée. *J. pharm. chim.* 8: 515-518 (1928). 51 references.

DAHLBERG, A. C., and MARQUARAT, J. C. Creaming of raw and pasteurized milk. *N. Y. State Agr. Expt. Sta., Tech. Bull.* 157: 75-80 (1929).

KAY, R. R., and M'CANDLICH, ANDREW C. Factors affecting the yield and quality of milk. I. The age of the cow. *J. Agr. Sci.* 19: 371-372 (1929). 69 references.

KOLDA, J. Du passage des substances medicamenteuses dans le lait. *Lait* 6: 282-287 (1926). 202 references.

LATAIX, A. Contribution a l'étude de la refractometrie des lactoserums. *Lait* 9: 474-491, 612-622, 711-723, 844-858 (1929). Bibl. footnotes.

LENKEIT, WALTER, und LINTZEL, WOLFGANG. Milch und Milchprodukte. In *Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirt-*

MILK—Cont'd

schaftlichen Nutztiere, I: 495-497 (1929). 214 references.

LOHNIS, F., *et al.* Mykologie (Mikrobiologie) der Milch. *In* Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 168-169, 194-195, 212-219 (1930).

NATIONAL INSTITUTE FOR RESEARCH IN DAIRYING. Studies concerning the handling of milk. 3rd ed. London, H. M. Stationery Off., 1929. 91 p. Bibl., p. 89-91.

OSTERBERG, —, and LIEPUS, T. Bericht über das Studium der milchwirtschaftlichen Fachliteratur, die sich speciell mit der Metallfrage befasst. *Milchwirtschaft Literaturber.*, No. 36: 202-210 (1930). 207 references.

PALOW, CARL FREIHERR VON. Weitere Studien über die Vererbung der Milchleistung beim Rinde. *Tierzüchtung u. Züchtungsbiol.* 17: 152-159 (1930). 177 references.

PORCHER, CH. La méthode synthétique dans l'étude du lait. Le lait au point de vue colloidal. *Lait* 9: 449-474, 752-612, 681-711, 793-816, 942-970, 1051-1076 (1929); 10: 47-68, 146-175, 291-323, 401-427, 509-528, 667-683, 794-812, 900-918, 1011-1026, 1123-1137 (1930). 304 footnotes.

REINLE, HANS. Ueber die Wirkung der Becquerel- und Röntgenstrahlen sowie des ultravioletten Lichtes auf die Peroxydase und Methylenblau-Formalin-Reduktase-Reaktion der Kuhmilch. *Biochem. Z.* 115: 19-21 (1921). 77 references.

ROSSI, PAUL. Etude expérimentale de certains sous-produits du lait tuberculeux. *Lait* 8: 676-678 (1928). 40 references.

ROSSI, PAUL. Le sérum de caséinerie et quelques sous-produits de l'industrie laitière. *Lait* 10: 288-291 (1930). 71 references.

RUDIGER, M., and WURSTER, K. Die Bindungsverhältnisse des Milchkalkes und ihre Bedeutung für die Labgerinnung. *Biochem. Z.* 216: 398-399 (1929). 64 references.

SCHEUNERT, A., and SCHIEBLICH, M. Vitamine der Milch. *In* Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 103-109 (1930).

WEIGMANN, H. Milchpräparate. *In* Winkler, Handbuch der Milchwirtschaft 2, pt. 2: 277-278, 298-300, 316-317 (1931).

WINKLER, WILLIBALD. Handbuch der Milchwirtschaft. Vienna, Springer, 1930. 4 vols. Literature at end of sections.

Serial

Journal of Dairy Research. 1+. 1929+. Contains abstracts and reviews.

Le Lait. 1+. 1921+. Contains: Bibliographie analytique. Bulletin bibliographique. Brevets.

Milchwirtschaftliche Forschung. 1+. 1924+. Contains "Referatenteil."

Milchwirtschaftlicher Literaturbericht. 1+. 1927+. Classified abstracts.

MILK: Analysis and Inspection.

DEMETER, KARL J. Die Untersuchungen der Milch. Bakteriologische und biologische Untersuchungsmethoden. *In* Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 383-387 (1930).

GRIMMER, W. Die Untersuchungen der Milch. Physikalische und chemische Untersuchungsmethoden. *In* Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 333-334 (1931).

ELSDON, G. D., and STUBBS, J. R. The freezing point of milk and its applications. *J. Soc. Chem. Ind.* 50: 140-141T (1931). About 100 references. *Analyst* 55: 432 (1930). 39 references.

NEUKOMM, A. Le contrôle bactériologique du lait par les méthode de Skar. *Lait* 7: 850-851 (1927). 48 references.

NEVOT, ARMAND. Les méthodes de contrôle hygiénique des laits, leur application aux laits parisiens. Paris, Librairie le François, 1930. 94 p. Bibl., p. 90-92.

ROBERTSON, A. H., and FRAYER, J. M. Variability, accuracy and adaptability of some common methods of determining the keeping quality of milk. *Vt. Agr. Expt. Sta., Bull.* 314. 1930. 46 p. Bibl., p. 45-46.

MILK: Bacteriology.

MATTICK, A. T. R. Methods of determining the number of bacteria in milk. *J. Dairy Research* 1: 134-135 (1930). 47 references.

SANSONETTI, F. Sur les flores microbiene et fongique de caillés du lait. *Lait* 10: 1116-1123 (1930). 144 references.

ZARIBNICKY, FRANZ. Untersuchungen über den Eiweissabbau in Milch durch Milchsäurebakterien. *Milchwirt. Forschungen* 3: 458-459 (1926). 52 footnotes.

See also YEAST (Nissen).

MILK: Composition.

BLEYER, B. Zusammensetzung und Eigenschaften der Milch. *In* Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 84-87 (1930).

GRIMMER, W. Die Veränderung der Milch durch Krankheiten der Milchtier. In Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 297-299 (1930).

KIEFERLE, W. Veränderung der Milch durch physikalische, chemische und biologische Vorgänge. In Winkler, Handbuch der Milchwirtschaft 1, pt. 1: 282-285 (1930).

MILK: Food Value.

CRUMBINE, SAMUEL J., and TOBEY, JAMES A. The most nearly perfect food; the story of milk. Baltimore, Williams and Wilkins, 1929. 292 p. Bibl., p. 78-80, 281-283.

DEMUTH, F. Zur Physiologie und pathologischen Physiologie der Milchverdauung im Säuglingsalter. Ergebnisse inneren Medizin u. Kinderheilkunde 29: 91-105 (1926).

DE SANTIS, A. G., and CRAIG, J. D. Critical clinical study of concentrated and dried infant food. Arch. Pediatrics 48: 455-456 (1931). 41 references.

EVAPORATED MILK ASSOCIATION. Infant feeding with unsweetened evaporated milk. Chicago, The Association, 1931. 7 p. 41 references, annotated.

EVAPORATED MILK ASSOCIATION. Nutritive value of evaporated milk. Chicago, The Association, 1931. 14 p. Bibl., p. 12-14. 109 references.

MACY, ICIE G., and OUTHOUSE, JULIA. The vitamin content of milk used in infant feeding. Am. J. Diseases Children 37: 379-400 (1929). 68 footnotes.

MARRIOTT, M., and SCHOENTHAL, L. Experimental study of the use of unsweetened evaporated milk for the preparation of infant feeding formulas. Arch. Pediatrics 46: 135-148 (1929). 33 references.

RICE, F. E. Evaporated and condensed milk from the chemical and nutritional point of view. Ind. Eng. Chem. 22: 48 (1930). 45 references.

TRENDL, F. Die Milch als Nahrungsmittel. In Winkler, Handbuch der Milchwirtschaft 2, pt. 1: 62-73 (1931).

MILK: Euman.*

HOEBLER, B. RAYMOND. Present status of human milk production. J. Am. Dietetic Assoc. 6: 25-28 (1930). 76 references.

MILK SUPPLY

BEYTHIEN, A., and ERNST, W. Milchkontrolle in den Städten. In Winkler, Handbuch der Milchwirtschaft 2, pt. 2: 315-319 (1931).

LICHTENBERGER, B., et al. Die Versorgung mit Konsummilch. In Winkler, Handbuch der Milchwirtschaft 2, pt. 1: 127, 161, 170-172, 179-180, 198-199, 228-229, 243-245, 254-255, 283-285 (1931).

MINE GASES

FORBES, J. J., and GROVE, G. W. Mine gases and methods for their detection. U. S. Bur. Mines, Miners' Circ. 33. 1929. 65 p. 79 footnotes.

HERNDON, R. F. Clinical study of the effects of mine gases. J. Ind. Hygiene 9: 418-420 (1927).

PAYMAN, W., and STATHAM, I. C. F. Mine atmospheres. London, Methuen, 1930. 336 p. Bibl. footnotes.

MINERAL RESOURCES

AHNERT, E. E. Bibliography on the geology, useful minerals, flora and fauna of North Manchuria. Pt. 1. Geology and mineral resources. Bibl. Bull. Centr. Libr. Chinese Eastern Ry., 1927, no. 1-6: 4-18. (In Russian).

AHNERT, E. E. Bibliography of the mines and minerals of Asiatic Russia. Bull. China Inst. Mining Met. 1926, no. 4: 104-146.

ASHLEY, GEORGE H. A syllabus of Pennsylvania geology and mineral resources. Pa. Geol. Survey, 4th ser., Bull. G 1. 1931. 159 p. Publications of Pennsylvania Geological Survey, p. 147-154; list of U. S. Geological Survey publications of Pennsylvania, p. 155-158.

AUSTRIA. Ministerium für öffentliche Arbeiten. St Joachimsthal. Vienna, 1911. 107 p. Bibl., p. 98-107.

CONNOLLY, JOSEPH P., and O'HARRA, CLEOPHAS C. The mineral wealth of the Black Hills. South Dakota, State School of Mines, Bull. No. 16. 1929. 418 p. Bibl. footnotes.

DARMSTEDTER, ERNST. Berg-, Probir- und Kunst-büchlein. München, Münchner Drucke, 1926. 109 p. Bibl., p. 59-109.

FURNESS, JAMES W., and JONES, L. M. Mineral raw materials: Survey of commerce and sources in major industrial countries. U. S. Bur. Foreign and Domestic Commerce. Trade Promotion Series No. 76. 1929. 278 p. Bibl., p. 277-278.

GOUGH, JOHN W. The mines of Mendip. Oxford, Clarendon Press, 1930. 269 p. Bibl., p. 258-264.

JOHNSON, J. H. Bibliography of geology of North Central Colorado. Quarterly Colorado School Mines 22, no. 4. 1927. 38 p.

MINERAL RESOURCES—*Cont'd*

KITSON, ALBERT E., and FELTON, W. J. References to occurrences of economic minerals in the Gold Coast. Gold Coast, Geol. Survey, Bull. No. 5. 1930. 35 p.

KRYSHTOFVICH, A. Bibliography of Russian literature on the geology of the Far East and of the Pacific, 1926-1927. Bull. Pacific Committee of the Academy of Sciences of the U. S. S. R., No. 1: 5-49 (1929). Useful minerals (gold, platinum, coal, oil, etc.), p. 20-44.

ONTARIO. *Dept. of Mines*. General index to the reports of the Ontario Department of Mines, volumes xxvi to xxxv. (1917-1927). Toronto, 1928. 668 p.

PASCOE, EDWIN. Bibliography of Indian geology and minerals. *Rec. Geol. Survey India* 53: 27-33 (1921); 54: 61-67 (1922); 55: 43-51 (1923); 56: 56-64 (1924); 58: 68-74 (1925); 59: 108-114 (1925); 60: 119-127 (1927); 61: 132-140 (1928); 62: 174-184 (1929); 63: 145-154 (1930); 65: 148-160 (1931).

SHEDD, SOLON. Bibliography of the geology and mineral resources of California to the end of 1929. *Calif., Dept. Natural Resources, Division of Mines and Mining, Bull.* No. 104. 1931. 205 p.

SÖMME, AXEL. *La Lorraine métallurgique*. Paris, Berger-Levrault, 1930. 249 p. *Bibl.*, p. 235-242.

MINERALS

ÄHLANDER, F. E. Catalog of Swedish geological, paleontological, petrographic and mineralogical literature. 1924. *Geol. Fören. Förh.* 47: 512-520 (1925). 144 titles. 1925. 48: 584-592 (1926). 162 titles.

BERTHELOT, CHARLES, and ORCEL, J. *Les minerais; étude, préparation mécanique, marché*. Paris, Baillière. 1930. 544 p. *Bibl.*, p. 527-536.

BLACK, GEORGE F. List of works relating to the geology, mineralogy and paleontology of New Jersey. New York, New York Public Library, 1916. 36 p.

BOWLES, OLIVER. Selected bibliography on minerals and their identification. U. S. Bur. Mines, Information Circ. No. 6148. 1929. 4 p. Mimeographed.

CHIRVINSKII, P. Beiträge zur Mineralogie Russlands *Z. Krist.* 58: 386-403 (1923); 65: 361-379 (1927); 70: 249-282 (1929). *Bibl.* footnotes.

DIEFENBACH, A. Mineralogische und chemische Untersuchungen von dem Cloizit und Mottramit aus dem Otavi-

bergland. *Z. Krist.* 74: 186-188 (1930). 46 references.

DOELTER, C. Colloid minerals. In Alexander, Colloid Chemistry III: 282 (1931). 52 references.

FARNHAM, CHARLES M. Determination of the opaque minerals. New York, McGraw-Hill, 1931. 236 p. *Bibl.*, p. 14-20.

FITCH, A. A. Spectrum analysis in mineralogy. London, Adam Hilger, Ltd., 1931(?). 52 p. *Bibl.*, p. 44-52. 91 references.

LIEZT, J. Beiträge zur Kenntnis der Pyromorphit - Mimetesit - Vandinit - Gruppe. *Z. Krist.* 77: 497-498 (1931). 47 references.

MANCHESTER, JAMES G. The minerals of New York City and its environs. *Bull. New York Mineralogical Club*, 3, No. 1. 1931. 168 p. *Bibl.*, p. 123-168.

MORTOLA, EDELMIRA. *Nociones de mineralogia*. Buenos Aires, Imprenta Univ., 1930. 320 p. *Bibl.* 302-306.

NEUHAUS, A. Ueber anomale kristallisierte Mischsysteme mit nur organischen Komponenten sowie mit einer anorganischen Wirt- und einer organischen Gaskomponente. *Chemie der Erde* 5: 552-553 (1930). 42 references.

NEUHAUS, A. Ueber anomale kristallisierte Mischsysteme von Typus des sogenannten Eisensalmiaks. *Chemie der Erde* 5: 623-624 (1930). 39 references.

SANDEGREN, R. Catalog of Swedish geological, paleontological, petrographic and mineralogical literature. 1927. *Geol. Fören. Förh.* 50: 782-798 (1928). 197 titles. 1928. 51: 580-588 (1929). 180 titles.

SANDEGREN, R., and MAGNUSSON, M. Annual review of Swedish geological literature for 1929. *Geol. Fören. Förh.* 52: 689-754 (1930). 190 titles.

SHEDD, ARTHUR C. Chemical analyses of Oklahoma mineral raw materials. *Univ. Okla. Bull.*, new series 423. *Studies* No. 32. 1928. 136 p. *Bibl.*, p. 14-20.

SPANGENBERG, K., and NEUHAUS, A. Künstlich gefärbte Kristalle als Beispiele sogenannter anomaler Mischkristalle und ihre mineralchemische Bedeutung. *Chemie der Erde* 5: 437-528 (1930). 160 footnotes.

SPENCER, L. J. Mineralogical chemistry. In Annual reports on the progress of chemistry 24: 292-313 (1927). 93 footnotes. 26: 253-313 (1927). 102 footnotes.

VOSKUIL, WALTER H. Minerals in modern industry. New York, Wiley, 1930. 350 p. *Bibl.*, p. 338-341.

WOOTTON, THOMAS P. Geologic literature of New Mexico. N. Mex. State Bureau of Mines and Mineral Resources, Bull. No. 5. 1930. 127 p. Includes mineralogy.

MINERALS: Analysis.

ORCEL, J. Les méthodes d'examen microscopique des minerais métalliques. Bull. soc. franç. mineral. 48: 344-361 (1925); Tech. moderne 21: 737-741 (1929). 171 references.

REIKE, R., and WIESE, O. Die Anfärbemethode in der Keramik und bei Mineraluntersuchungen. Ber. deut. keram. Ges. 59:153-155 (1928). 50 references.

SHORT, M. N. Microscopic determination of the ore minerals. U. S. Geol. Survey, Bull. 825. 1931. 204 p. Bibl. footnotes.

MINERALS: Synthetic.

EITEL, W. Mineralsynthese. In Stähler, Handb. Arbeitsm. anorg. Chem. 4:391-447 (1926). Bibl. footnotes. See also SPINEL.

MIOTICS.* See PHARMACEUTICALS (Munch).

MOLASSES

V. BRODOWSKI, ALEXANDER. Ueber Kolloide in der Melasse. Kolloidchem. Beihefte 29:262-353 (1929). Bibl. footnotes.

DEDEK, J. Constitution of beet molasses. Chem. Listy 21:96-101, 163-170, 291-297, 317-323 (1927).

MOLECULAR ASSOCIATION

LONGINESCU, G. G. Molecular association. Chem. Reviews 6:417-418 (1929). 40 references.

MOLECULAR BEAMS*

RODEBUSH, WORTH H. Molecular rays. Rev. Modern Physics 3:410-411 (1931). 49 references.

TAYLOR, JOHN B. Molecular beams. Ind. Eng. Chem. 23:1231 (1931). 40 references.

MOLECULAR FIELD*

KEYES, FREDERICK G. Present status of the molecular field problem. Chem. Reviews 6:215-216 (1929). 60 references.

MOLECULAR STRUCTURE*

BRIEGLER, G., and WOLF, K. L. Lichtzerstreuung, Kerr-Effekt und Molekülstruktur. Fortschritte Chem., Physik, physik. Chem. 21:1-58 (1931). Bibl. footnotes.

BRÜCHE, E. Freie Elektronen als Sonden des Baues der Molekeln. Ergebnisse exakt. Naturwissenschaften 8:227-228 (1929). 60 references.

ESTERMANN, L. Elektrische Dipolmomente von Molekülen. Ergebnisse

exakt. Naturwissenschaften 8:304-306 (1929). 115 references.

HUND, F. Molekelbau. Ergebnisse exakt. Naturwissenschaften 8:182-184 (1929). 83 references.

PAULING, LINUS. The nature of the chemical bond. Application of results obtained from the quantum mechanics and from a theory of paramagnetic susceptibility to the structure of molecules. J. Am. Chem. Soc. 53:1367-1400 (1931). 45 footnotes.

SACK, H. Dipolmoment und Molekülstruktur. Ergebnisse exakt. Naturwissenschaften 8:363-366 (1929). 114 references.

SMYTH, CHARLES P. Electric moment, molecular orientation and structure in aliphatic compounds. Chem. Reviews 6:586-587 (1929). 77 references.

WILLIAMS, JOHN WARREN. The structure of molecules as revealed by dielectric constant data. Chem. Reviews 6:618-619 (1929). 55 references.

See also ELECTRONICS.

MOLECULAR WEIGHTS

Cryoscopy. Ebullioscopy. Molecular weights. In Tables Annuelles 6:833-839 (1928); 7:1110-1126 (1930). References through text.

See also CRYOSCOPY.

MOLYBDATES*

DITTLER, E. Molybdate. In Doelter, Handb. Mineralchem. 4, pt. 2:781-807 (1929). Bibl. footnotes.

MELLOR, J. W. Molybdates. In his Inorg. Theor. Chem. 11:576-580, 590-591, 594-595, 599, 604-605, 609 (1931).

ZAMBONNI, F., and CAGLIOTI, V. Ricerche sui mangani-molibdati. Gazz. chim. ital. 59:400-460 (1929). Bibl. footnotes.

MOLYBDENUM

CAZAUD, R. Le molybdène. Aciers spéciaux 4:523-524 (1929). 29 references.

DITTLER, E. Molybdän. In Doelter, Handb. Mineralchem. 4, pt. 2:743-762 (1929). Bibl. footnotes.

MELLOR, J. W. Molybdenum. In his Inorg. Theor. Chem. 11:484-672 (1931). History, p. 485-486; occurrence, p. 489-492; extraction, p. 498-499; physical properties, p. 509-512; chemical properties, p. 518-520; atomic weight and valency, p. 521-522; alloys, p. 524-525. Bibliographies on the various compounds of molybdenum through text.

MOLYBDENUM CHLORIDES*

MELLOR, J. W. Molybdenum chlorides and oxychlorides. In his Inorg. Theor. Chem. 11:626-627, 634 (1931).

MOLYBDENUM OXIDES

MELLOR, J. W. Molybdenum oxides. *In his Inorg. Theor. Chem.* 11: 526, 533-535, 548-551 (1931).

MOLYBDENUM PHOSPHATES *

MELLOR, J. W. Molybdenum phosphates. *In his Inorg. Theor. Chem.* 11: 672 (1931).

MOLYBDENUM SULFIDES *

MELLOR, J. W. Molybdenum sulphides. *In his Inorg. Theor. Chem.* 11: 648-650 (1931).

MONAZITE

SANTMYERS, R. M. Monazite, thorium and cerium. U. S. Bur. Mines, Information Circ. 6321. 1930. 43 p. Bibl., p. 39-43.

MORPHINE

REIMERS, F. Die quantitative Bestimmung von Morphin in Opium. Uebersicht über die Arbeiten der letzten 10 Jahren. *Arch. Pharm.* 269: 529-530 (1931). 55 references.

TRIER, GEORG. Alkaloide des Opiums. Morphin. *In his Die Alkaloide*, 2. Aufl., 479-567 (1931). Bibl. footnotes.

WACHTEL, CARL. Nachweis und Bestimmung des Morphins und anderer Alkaloide in tierischen Ausscheidungen und Organen. *Biochem. Z.* 120: 282-283 (1921). 25 references.

MOTHPROOFING

CLARK, C. O. The protection of animal fibres against clothes moths and dermestid beetles. *J. Textile Inst.* 19: 295-319P (1928). Bibl., p. 319P; 29 references. Patents abstracted through text.

ROARK, R. C. An index of patented mothproofing materials. U. S. Dept. Agr., Bur. Chem. Soils, Insecticide Division, May, 1931. 125 p. Bibl., p. 114-125. Mimeographed.

ROARK, R. C. Chemically combating clothes moths. *Soap* 3, no. 12: 95, 97, 99, 101 (1928). Patents on mothproofing.

ROARK, R. C. Recent mothproofing patents. *Textile Colorist* 52: 25-28 (1930); 53: 301-305 (1931).

MOTOR FUELS *

DIETRICH, K. R., and JEGLENSK, H. Die Untersuchungen der Alkoholkraftstoffen. *Z. Spiritusind.* 52: 138-140 (1929). 28 footnotes.

VOGEL, WALTER. Flüssige Brenn- und Treibstoffe. *Petroleum* 27: 620-621 (1931). 65 references.

See also BENZOLE, GASOLINE, PETROLEUM.

MUCIN

INOUE, J. M. Biochemical study of salivary mucin. *J. Dental Research* 10: 20-21 (1930). 39 references.

MUSCARINE. *See* PHARMACEUTICALS (Munch).

MUSCLE

BIEDERMANN, W. Histochemie der quergestreiften Muskelfaser. *Ergebnisse Biol.* 2: 449-504 (1927).

CAHN, THÉOPHILE. Revue critique de nos connaissances sur la composition chimique et la structure histologique du muscle normal et atrophié. *Ann. physiol.* 2: 674-681 (1926). 103 references.

EGGLETON, P. The position of phosphorus in the chemical mechanism of muscular contraction. *Physiol. Rev.* 9: 458-461 (1929). 130 references.

EMBEDEN, GUSTAV. Chemismus der Muskelkontraktion und Chemie der Muskulatur. *In Handb. der normalen und pathologischen Physiologie* 8: 369-475 (1925). Bibl. footnotes.

FLEISCHMANN, WALTER. Ueber die Verwertung der Oxydationsenergie des Alkohols bei der Muskelarbeit. *Biochem. Z.* 219: 7-29 (1930). 56 footnotes.

GASSER, HERBERT S. Contractions of skeletal muscle. *Physiol. Rev.* 10: 96-109 (1930). 269 references. Includes effects of chemical agents.

KAPPELLER-ADLER, R., and KRAEL, J. Untersuchungen über die Stickstoffverteilung in den Muskeln verschiedener Tierklassen. *Biochem. Z.* 221: 437-460 (1930). 70 footnotes.

LINDHARD, J. Der Skelettmuskel und seine Funktion. *Ergebnisse Physiol.* 33: 337-344 (1931). Includes chemical composition and reactions.

MARTINO, G. Sul significato fisiologico della fosfocreatina muscolare. *Arch. farmacol. sper.* 50: 42 (1929). 39 references.

MEYERHOF, OTTO. Atmung und Anaerobiose des Muskels. *In Handbuch der normalen und pathologischen Physiologie* 8: 476-499 (1925). Bibl. footnotes.

MEYERHOFF, OTTO. Die chemischen Vorgänge im Muskel und ihr Zusammenhang mit Arbeitsleistung und Wärmebildung. Berlin, Springer, 1930. 350 p. Bibl., p. 319-342.

MEYERHOFF, OTTO. Thermodynamik des Muskels. *In Handbuch der normalen und pathologischen Physiologie* 8: 500-529 (1929). Bibl. footnotes.

MILROY, T. H. Present status of the chemistry of skeletal muscular contraction. *Physiol. Rev.* 11: 546-548 (1931). 71 references.

NACHMANSOHN, DAVID. Die Guanidinophosphorsäuren ("Phosphagene") des Muskels. *In* Oppenheimer,

- Handb. Biochem., 2. Aufl., Ergänzungsband: 162-174 (1930). 44 footnotes.
- NEUSCHLOSZ, S. M. Die physikalische Chemie der Muskels. *In* Handbuch der normalen und pathologischen Physiologie 8, pt. 1:124-145 (1925). Bibl. footnotes.
- PARNAS, J. K. Le métabolisme du muscle en activité. *Compt. rend. soc. biol.*, 101, Réunion plénière: 67-70 (1929). 53 references.
- RIESSER, O. Allgemeine Pharmakologie der Muskels. *In* Handbuch der normalen und pathologischen Physiologie 8:315-368 (1929). Bibl. footnotes.
- RITCHIE, ARTHUR DAVID. The comparative physiology of muscular tissue. Cambridge, Univ. Press, 1928. 111 p. "References" at the end of each chapter.
- WACHER, LEONARD. Kohlendruck oder Eiweißquelle als Ursache der Muskelkontraktion? *Biochem. Z.* 107:117-144 (1920); 120:284-302 (1921). 93 footnotes.
- WASTL, HELENE. Ueber den Einfluss des Adrenalins und einiger anderer Inkrete auf die Kontraktionen des Warmblüterskelettmuskels. *Arch. ges. Physiol.* 219:337-390 (1928). Bibl. footnotes.
- See also* GLOBULIN.
- MUSK**
- DELANGE, RAYMOND. Constitution chimique des différents corps à odeur de muse. *J. pharm. chim.* 8:316-330, 364-375 (1928). Bibl. footnotes.
- MYDRIATICS.*** *See* PHARMACEUTICALS (Munch).
- NAPHTHALENE**
- KREBSER, A. Naphthalinabkömmlinge. *In* Ullman, Enzyk. tech. Chem., 2nd ed., 7:788-855 (1931). References through text.
- NAPHTHENES**
- ZAKARIAN, G. Étude bibliographique du cracking des naphthènes. *Ann. combustible liquides* 1:665-672 (1926). 15 footnotes.
- NARCOSIS**
- HENDERSON, V. E. The present status of the theories of narcosis. *Physiol. Rev.* 10:216-220 (1930). 190 references.
- Narcosis and narcotics. *Index-Cat.*, S. G. O., 3rd ser., 8:13-14 (1929). 48 references.
- TRAUBE, J. Die Grenzflächenaktivitätstheorie (Haftintensitätstheorie, Oberflächenaktivitätstheorie) der Narkose. *Arch. ges. Physiol.* 218:749-766 (1928). 66 footnotes.
- WINTERSTEIN, HANS. Die Narkose. 2. Aufl. Berlin, Springer, 1926. 474 p. Bibl., p. 409-463. 1120 references.
- NECROSIS ***
- WELLS, H. G. Retrogressive changes (necrosis, etc.). *In* his *Chemical Pathology*, 5th ed., 408-485 (1925). 550 footnotes.
- NEOSALVARSAN.** *See* ARSPHENAMINE.
- NEPHRITIS ***
- GRAY, JOHN. Causes and sequences in nephritis. *J. Path. Bact.* 31:211-213 (1928). 87 references.
- LEBERMANN, F. Der Wasserversuch und seine klinische Bedeutung. *Ergebnisse inneren Medizin u. Kinderheilkunde* 38:356-371 (1930).
- MITCHELL, A. G. Nephrosclerosis (chronic interstitial nephritis) in childhood. *Am. J. Diseases Children* 40:382-388 (1930). 210 references.
- NEPHROSIS ***
- GAINSBOROUGH, HUGH. So-called lipid nephrosis. *Quart. J. Med.* 23:125-127 (1929). 152 references.
- LEITER, LOUIS. Nephrosis. *Medicine* 10:136-242 (1931). 229 references.
- WAHL, ROBERT. Le problème de la néphrose lipidique. Thesis, Univ. Paris, 1929. 192 p. Bibl., p. 171-190.
- NEROL ***
- SORNET, R. Le nérol. *Rev. chim. ind.* 39:98-104 (1930). Bibl. footnotes.
- NERVES**
- FRÖHLICH, ALFRED. Pharmakologie des vegetativen (autonomen) Nervensystems. *In* Handbuch der normalen und pathologischen Physiologie 10:1095-1118 (1927). Bibl. footnotes.
- FRÖHLICH, ALFRED. Pharmakologie des Zentralnervensystems. *In* Handbuch der normalen und pathologischen Physiologie 10:1018-1047 (1927). Bibl. footnotes.
- Nervous system, chemistry of. *Index-Cat.*, S. G. O., 3rd ser., 8:110-111 (1929). 34 references.
- Nervous system, effects of chemical and physical agents on. *Index-Cat.*, S. G. O., 3rd ser., 8:131-132, 158, 185 (1929). 146 references.
- Nervous system, metabolism of. *Index-Cat.*, S. G. O., 3rd ser., 8:139 (1929). 40 references.
- PERITZ, GEORG. Chemie des Zentralnervensystems. *In* Oppenheimer, Handb. Biochem., 2nd ed., 4:360-388 (1925). 111 footnotes.

NERVES—Cont'd

ZONDEK, S. G. Ueber das Wesen der Vagus- und Sympathicusfunktion. Die Identität von Nerven- und Ionenwirkung. *Biochem. Z.* 132: 391-392 (1922). 48 references.

See also COLLOIDS (Bancroft).

NICKEL

EWING, D. T., ARCHER, J. S., and SHADDUCK, H. Bibliography of electrodeposition of nickel. Michigan Eng. Expt. Sta., Bull. 26. 1929. 87 p. Over 600 papers from 1905-1929, arranged alphabetically by authors, with short abstracts. Subject index.

INTERNATIONAL NICKEL COMPANY. Literature and patent references to nickel. New York, The Company, 1930 +.

NICKEL PLATING.* See ELECTROPLATING.

NICKEL SULFATES

DOELTER, C. Nickelsulfate. In *his* Handb. Mineralchem. 4, pt. 2: 610-618 (1927). Bibl. footnotes.

NICOTINE

ALTPETER, J. Die Gewinnung des Nikotins und seine Verwendung. Metallbörse 19: 1069-1070, 1124-1126 (1929). Patent review.

Nicotin. Index-Cat., S. G. O., 3rd ser., 8: 253-254 (1929). 65 references.

TRIER, GEORG. Alkaloid des Tabaks. Nicotin. In *his* Die Alkaloide, 2. Aufl., p. 335-356 (1931). Bibl. footnotes.

See also PHARMACEUTICALS (Munch).

NIOBIUM

MARKS, SYDNEY. Niobium. In *Friend's* Textbook Inorg. Chem. 6, pt. III: 117-133, 134-171 (1929). Bibl. footnotes.

NITRIC ACID

KLEMENC, ALFONS, and HAYEK, ERICH. Ueber die Einwirkung des Stickoxydes auf Salpetersäure bis zur Erreichung des Gleichgewichtes. *Z. anorg. allgem. Chem.* 186: 223-224 (1929). 42 references.

See also CATALYSTS (Kausch).

NITRIFICATION. See NITROGEN FIXATION.

NITROBENZENE

Nitrobenzol. Index-Cat., S. G. O., 3rd ser., 8: 263 (1929). Includes toxicology. 43 references.

NITROCELLULOSE

MUHLENDAILL, ERNST V. Dünnlösliche Nitrocellulosen. *Farben-Ztg.* 34: 1063-1065 (1929). 57 footnotes.

NITROGEN

JOHNSON, BETRAND L. Nitrogen and its compounds. U. S. Bur. Mines, Information Circ. 6385. 1931. 33 p. Bibl., p. 31-33.

KNESER, H. O. Der aktive Stickstoff. *Ergebnisse exakt. Naturwissenschaften* 8: 255-257 (1929). 87 references.

Nitrogen. Index-Cat., S. G. O., 3rd ser., 8: 264-266 (1929).

PASCAL, PAUL. Synthèses et catalyses industrielles; fabrications minerales. 2. ed. Paris, Hermann, 1930. 456 p. Contains bibls.

NITROGEN: Metabolism.*

DELAUNAY, H. L'excrétion azotée des invertébrés. *Biol. Rev. Cambridge Phil. Soc.* 6: 298-301 (1931). Classified.

See also BIOCHEMISTRY (Peters and Van Slyke).

NITROGEN FIXATION

ALLAM, F. Vom Energieverbrauch der Knöllchenbakterien bei der Bindung des Luftstickstoffs. *Z. Pflanzenernährung, Düngung u. Bodenk.* 20A: 300-301 (1931). 46 references.

ALLISON, F. E. Can nodule bacteria of leguminous plants fix atmospheric nitrogen in the absence of the host. *J. Agr. Research* 39: 922-924 (1929). 38 references.

FULLER, J. E., and RETTGER, L. F. Influence of combined nitrogen on the growth and nitrogen fixation by azotobacter. *Soil Science* 31: 233-234 (1931). 37 references.

HOPKINS, E. W. Studies of nitrogen fixation by the root nodule bacteria of the leguminosae. *Soil Science* 28: 445-447 (1929). 53 references.

Nitrification. Index-Cat., S. G. O., 3rd ser., 8: 262 (1929). 33 references.

PAULING, HARRY. Elektrische Luftverbrennung. Halle, Knapp, 1929. 188 p. Bibl., p. 185-187.

STAPP, C. Die Stickstoffbindung durch Bakterien. *Proc. Papers First Intern. Congress Soil Sci.* 3: 142-143 (1928). 80 references.

WALKER, R. H. Physiological studies on the nitrogen-fixing bacteria of the genus *Rhizobium*. *Iowa Agr. Expt. Sta., Research Bull.* 113: 403-406 (1928). 54 references.

See also CATALYSTS (Kausch).

NITROSOLS.* See IRON: CHEMISTRY (Koppel).

NITROUS OXIDE

Nitrous oxide. Index-Cat., S. G. O., 3rd ser., 8: 267-270 (1929). Includes use as anesthetic.

NOVASUROL*

Novasurol. Index-Cat., S. G. O., 3rd ser., 8: 325-326 (1929). 33 references.

NOVOCAINE

Novocain. Index-Cat., S. G. O., 3rd ser., 8: 326-327 (1929). 57 references.

NUCLEASES

CHROMETZKA, FR., and SCHITTENHELM, A. Spezifische Nucleasen. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 1: 711-748 (1920). Bibl. footnotes.

NUCLEIC ACIDS

HAMMARSTEN, EINAR. Zur Kenntnis der biologischen Bedeutung der Nucleinsäureverbindungen. Biochem. Z. 144: 465-466 (1924). 44 references.

LEVENE, P. A. Nucleoproteine, Nucleinsäuren, Nucleinbasen. In Oppenheimer, Fermente, 3: 360-389 (1929). 67 footnotes.

LEVENE, P. A., and BASS, L. W. Nucleic acids. New York, Chem. Cat. Co., 1931. 330 p. Bibl. footnotes.

NUTRITION

BENEDICT, FRANCIS G., and MACLEOD, GRACE. Heat production of the albino rat. Technique, activity control and the influence of fasting. II. Influence of environmental temperature, age and sex; comparison with the basal metabolism of man. J. Nutrition 1: 343-366, 367-398 (1929). 125 footnotes.

BIRCHER, EDWIN. Säuglingsernährung mit Fruchtmilch. 2. Aufl. Basel, Wendepunkt Verlag, 1930. 44 p. Bibl., p. 43-44.

BLUNT, KATHERINE, and COWAN, RUTH. Ultraviolet light and vitamin D in nutrition. Chicago, Univ. of Chicago Press, 1930. 229 p. References at end of each chapter.

BRONSON, BERNARD S. Nutrition and food chemistry. New York, Wiley, 1930. 467 p. Bibl. footnotes.

CHOMKOVIČ, G., and PODHRADSKY, J. Fortschritte auf dem Gebiete der Ernährung und Fütterung des Geflügels in den letzten Jahren. Wiss. Arch. Landw., Abt. B, Tierernähr. Tierzucht 2: 207-214 (1930).

DICKINS, D. Nutrition investigation of negro tenants in the Yazoo Mississippi Delta. Miss. Agr. Expt. Sta., Bull. 254: 48-52 (1928).

GR. BRITAIN. Medical Research Council. Iodine in nutrition: A review of existing information. Special Report Series No. 123. London, 1929. 108 p. Bibl., p. 98-102.

KOEHN, MARTHA, and MENDEL, LAFAYETTE B. The utilization of fatty oils given parenterally. J. Nutrition 1: 442-443 (1929). 44 references.

KRISS, MAX. Comparison of feeding standards for dairy cows, with especial reference to energy requirements. J. Nutrition 4: 160-161 (1931). 38 references.

LECOQ, RAOUL. Les aliments et la vie. 2. éd. Paris, Vigot frères, 1929. 260 p. Bibl. footnotes.

LOS ANGELES. Board of education. Outline for nutrition classes. Los Angeles, Dept. of health and corrective physical education, 1928. 148 p. Bibl. for nutrition class teachers, p. 147-149.

LUCK, J. MURRAY, SHEETS, GRACE and THOMAS, JOHN O. The rôle of bacteria in the nutrition of protozoa. Quart. Rev. Biol. 6: 47-58 (1931).

MCCOLLUM, ELMER V., and SIMMONDS, NINA. The newer knowledge of nutrition; the use of foods for the preservation of vitality and health. 4th ed. New York, Macmillan, 1929. 594 p. Bibl., p. 535-573.

MCLESTER, JAMES S. Nutrition and diet in health and disease. 2d ed. Philadelphia, Saunders, 1931. 891 p. Bibl. at end of most of the chapters.

MAGEE, H. E. The rôle of the small intestine in nutrition. Physiol. Rev. 10: 501-505 (1930). 197 references.

MARSH, M. ELIZABETH, and MURLIN, JOHN R. Muscular efficiency on high carbohydrate and high fat diets. J. Nutrition 1: 136-137 (1928). 28 references.

MASON, KARL E. Effect of purified diets and their modifications, on growth and testicular degeneration in male rats. J. Nutrition 1: 333-334 (1929). 28 references.

MITCHELL, H. H. The physiological effect of protein. J. Nutrition 1: 290-292 (1929). 89 references.

Nutrition. Index-Cat., S. G. O., 3rd ser., 8: 344-351 (1929).

PIERCE, H. B., OSGOOD, H. S., and POLANSKY, J. B. Absorption of glucose from the alimentary tract of rats deprived of the vitamin B complex. J. Nutrition 1: 269-270 (1929). 29 references.

RANDOIN, LUCIE. Les données et les inconnues du problème alimentaire. Paris, Presse Univ. France, 1927. 2 v. Bibl., part 2: 297-480.

RICHARDS, M. B. Manganese in relation to nutrition. Biochem. J. 24: 1589-1590 (1930). 40 references.

ROSE, M. S. What place have aluminum, copper, manganese and zinc in normal nutrition? J. Nutrition 1: 554-556 (1929). 72 references.

TSCHERKES, LEON A. Proteinogene Toxikosen. Biochem. Z. 182: 48-49 (1927). 58 references.

NUTRITION—Cont'd

- WINTER, A. R. Nutritive value of blood-meal protein for growth. Ohio Agr. Expt. Sta., Bull. 436: 38-42 (1929).
 WOODMAN, H. E. Rôle of cellulose in nutrition. Biol. Rev. Cambridge Phil. Soc. 5: 294-295 (1930). 57 references.

OCHERS

- BARKSDALE, JELKS. Ochers of Alabama. Alabama Geol. Survey, Bull. 41. 1930. 33 p. Bibl., p. 33.
 REIFENBERG, A. Die Entstehung der Mediterran-Roterde (Terra rosa). Kolloidchem. Beihefte 28: 142-147 (1929). 146 references.

ODORS. See PERFUMES.**OIL SHALE**

- HRAFIL, GUIDO, and FALSER, HEINZ. Die Oelschiefer Tirols. Leipzig, Barth, 1930. 121 p. Bibl., p. 115-117.
 WINKLER, HENRY VON, *ed.* Der Estländische Brennschiefer; Untersuchung, Gewinnung und Verwertung. Reval, Wassermann, 1930. 350 p. Bibl., p. 330-342.

OILS: Drying.

- CUTTER, J. O. Polymerization of drying oils. J. Oil Colour Chem. Assoc. 13: 66-81 (1930). Bibl. through text.
 SCHEIFELE, B. Eine einheitliche Theorie Trockenvorgangs und der Wärmepolymerisation fetter Öle. Z. angew. Chem. 42: 790 (1929). 29 references.
 WOLFF, M. Öle, Harze, Lacke. Kolloid Z. 49: 210-217 (1929). 89 references.
See also FATS and OILS, PAINTS.

OILS: Sulfonated. See FATS: SULFONATED.**OLEFINS.* See HYDROCARBONS, PETROLEUM (Faragher).****OLIGODYNAMY.* See METALS: OLIGODYNAMIC ACTION.****OPIUM**

- Opium. Index-Cat., S. G. O., 3rd ser., 8: 441-444 (1929).

OPTICAL ACTIVITY

- ASTBURY, W. T. Optical rotatory power of solid crystals. International Critical Tables VII: 354 (1930). 31 references.
 BLEYER, B., and SCHMIDT, H. Die Mutarotation und Rotation der Kohlehydrate unter dem Einfluss starker Säuren. Biochem. Z. 138: 119-141 (1929). 35 footnotes.
 DARMOIS, E. Salt effect and rotatory power. Trans. Faraday Soc. 26: 384-390 (1930). 21 references.

- EBERT, L., and KORTUM, G. Zur Frage der asymmetrischen Induktion, insbesondere der optischen Aktivität der Zimtsäure. Ber. 64B: 342-358 (1931). 43 footnotes.

- FREUDENBERG, KARL, and KUHN, WERNER. Regeln und Superposition bei der optischen Drehung. Ber. 64B: 703-734 (1931). 68 footnotes.

- KORTUM, G. Die Dispersion der optischen Drehung amorpher Systeme. Physik. Z. 31: 669-670 (1930). 128 references.

- KORTUM, G. Neuere Forschungen über die optische Aktivität chemischer Moleküle. Sammlung chem. chem.-tech. Vorträge, N. F. 10. 1932. 118 p. Bibl., p. 111-118. 254 references.

- LOWRY, T. M. Mutarotation. In Rapports sur les hydrates de carbone, p. 118-121. 185 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

- LOWRY, THOMAS. Optical rotatory power of liquids and solutions. International Critical Tables VII: 478-487 (1930). 2245 references.

- Rotatory power. In Tables Annuelles 7: 347-413 (1930): bibl., p. 412-413; 199 references. 8: 470-543 (1931); bibl., p. 541-543; 220 references.

- RULE, H. GORDON. Influence of polar substituents on the optical rotatory power of organic compounds. Trans. Faraday Soc. 26: 321-336 (1930). 44 references.

See also WALDEN INVERSION.

OPTOCHIN

- Optochin. Index-Cat., S. G. O., 3rd ser., 8: 449 (1929). 22 references.

- SCHMIDT, KONRAD. Kritische Zusammenfassung der Literatur über Optochin. Diss., Marburg, 1917. 36 p. 69 footnotes.

ORE DRESSING.* See COAL WASHING.**ORGANIC CHEMISTRY**

- BOEHM, THEODOR. Neuere Untersuchungen auf dem Gebiete der organischen Chemie. Arch. Pharm. 268: 381-430 (1930). 216 footnotes.

- FUSON, REYNOLD C. Some recent advances in theoretical organic chemistry. Chem. Reviews 7: 367-368 (1930). 44 references.

- HOUBEN, J., and FISCHER, W. Ueber die Kernkondensation von Phenolen und Phenoläthern mit Nitrilen zu Phenoläther-Ketimiden und -Ketonen. J. prakt. Chem. 123: 89-109 (1929). 100 footnotes.

- KEMPFF, RICHARD. Halogen-Verbindungen. In Houben, Meth. org. Chem., 3. Aufl., 3: 1060-1229 (1930). Bibl. footnotes.

- LEE, W. B. Periodic anomalies in the properties of long chain compounds. *Trans. Faraday Soc.* 23: 630-640 (1927). 43 footnotes.
- LEHMANN, E. Die Fortschritte in der organischen Chemie seit dem Jahre 1924. *Z. angew. Chem.* 42: 803-807, 820-821, 839-842, 853-856, 869-872 (1929); 43: 6-12, 47-50, 63-66, 81-90, 102-108, 130-133, 623-627, 635-642, 650-655, 669-672, 680-686, 708-711, 1061-1070, 1092-1097, 1112-1119, 1138-1142, 1142-1145 (1930); 44: 49-55 (1931). Over 1000 footnotes.
- MEERWEIN, HANS. Die Alkoxy- und Oxydo- (Alkylenoxyd-) gruppe. In *Houben, Meth. org. Chem.*, 3. Aufl., 3: 132-227 (1930). Bibl. footnotes.
- MELDOLA, R. The chemical synthesis of vital products and the interrelations between organic compounds. London, Arnold, 1904. Vol. 1. 339 p. Several thousand references through text.
- MEYER, KURT H., and MARK, H. Der Aufbau der hochpolymeren organischen Naturstoffe, auf Grund molekular-morphologischer Betrachtungen. Leipzig, Akad. Verlagsges., 1930. 264 p. Bibl., p. 244-253.
- Organic chemistry. In *Table Annuelles* 6: 1328-1331 (1928); 7: 1582-1586 (1930). 669 references to papers giving physical constants of organic compounds.
- PFEIFFER, PAUL. Organische Molekülverbindungen. Stuttgart, Enke, 1927. 470 p. Bibl. footnotes.
- SIDGWICK, N. V. Structure of divalent carbon compounds. *Chem. Reviews* 9: 87-88 (1931). 24 references.
- SLOTTA, K. H. Grundriss der modernen Arzneistoffsynthese. Stuttgart, Enke, 1931. 202 p. Bibl. footnotes, largely patents.
- STAUDINGER, H. Ueber die Konstitutionsaufklärung hochmolekular Verbindungen. *Z. physik. Chem.* 153A: 391-424 (1931). Bibl. footnotes.
- UNGER, F., and BOEHM, T. Neuere Untersuchungen auf dem Gebiete der organischen Chemie. *Arch. Pharm.* 266: 224-269 (1928). 300 footnotes.
- WASER, ERNST. Synthese der organischen Arzneimittel. Stuttgart, Enke, 1928. 227 p. Bibl. for each preparation.
- WASSERMANN, A. Die zwischenatomaren Bindungsfestigkeiten einiger isomerer Carbonsäuren und ihrer Ester. *Helv. Chim. Acta* 13: 113-119 (1930). 60 footnotes.
- WATERS, W. A. Substitution of linked aromatic ring systems. *Chem. Reviews* 7: 428-429 (1930). 50 references.
- WATSON, HERBERT B. Reactions of halogens with compounds containing the carbonyl group. *Chem. Reviews* 7: 199-201 (1930). 100 references.
- See also Names of individual compounds, HETEROCYCLIC COMPOUNDS.
- ORGANO-METALLIC COMPOUNDS**
- KLARMANN, EMIL. Darstellung metallorganischer Verbindungen. In *Abderhalden, Handb. biol. Arbeitsm.* 1, pt. 2: 2149-2307 (1929). Bibl. footnotes.
- See also ARSENIC: ORGANIC COMPOUNDS, FLUORINE: ORGANIC COMPOUNDS, SELENIUM: ORGANIC COMPOUNDS.
- ORNITHINE**
- MAHN, HERBERT. Ornithin. In *Abderhalden, Biochem. Handl.* 12: 538-543 (1930). Bibl. footnotes.
- OSMIUM**
- SIRK, H. Osmium. In *Doelter, Handb. Mineralchem.* 3, pt. 2: 1161-1162 (1926). 24 footnotes.
- OSMOTIC PRESSURE**
- Diffusion, Effusion. Osmotic pressure. Osmosis. Electroendosmosis. In *Tables Annuelles* 6: 840-845 (1928); 7: 1127-1132 (1930). References through text.
- FURTH, REINHOLD. Osmose. In *Auerbach and Hort, Handb. physik. tech. Mechanik* 7: 705-739 (1930). Bibl. footnotes.
- MÜNCH, ERNST. Die Stoffbewegungen in der Pflanze. Jena, Fischer, 1930. 234 p. Bibl., p. 230-234.
- Osmosis. Index-Cat., S. G. O., 3rd ser., 8: 470-471 (1929). 105 references.
- REMINGTON, ROE EUGENE. The high frequency Wheatstone bridge as a tool in cytological studies: with some observations on the resistance and capacity of the cells of the beet root. Thesis, Univ. of Minnesota, 1928. 338-399 p. Bibl., p. 390-399.
- See also MEMBRANES.
- OVARY***
- ADLER, L. Physiologie des Ovarium. In *Hirsch, Handb. inneren Sekretion* 2: 992-1014 (1929).
- Ovary, chemistry of. Index-Cat., S. G. O., 3rd ser., 8: 497-498 (1929). 32 references.
- Ovary, extract of. Index-Cat., S. G. O., 3rd ser., 8: 502-503 (1929). 51 references.
- Ovary, internal secretions of. Index-Cat., S. G. O., 3rd ser., 8: 506-507 (1929). 100 references.
- PARKES, A. S. Physiology of ovarian activity. *Biol. Rev. Cambridge Phil. Soc.* 3: 252-260 (1928). 304 references.

OVARY—Cont'd

PARKES, ALAN STERLING. The internal secretions of the ovary. New York, Longmans, 1929. 242 p. Bibl., p. 207-233.

SIMONNET, H. Contribution à l'étude de la sécrétion interne de l'ovaire. *Ann. physiol.* 3: 764-773 (1927).

OVUM

Ovum, effect of chemical and physical agents on. *Index-Cat.*, S. G. O., 3rd ser., 8: 529 (1929). 57 references.

OXALIC ACID

HAMMERSTEN, G. Calcium oxalate and its solubility in the presence of inorganic salts with special reference to the occurrence of oxaluria. *Compt. rend. trav. Lab. Carlsberg* 17, no. 11, 1929. 85 p. Bibl., p. 82-83. 44 references.

OXIDASES

Oxidase. *Index-Cat.*, S. G. O., 3rd ser., 8: 532-533 (1929). 58 references.

SUMINOKURA, K. Ueber die Laccase des japanischen Lacks. *Biochem. Z.* 224-321 (1930). 29 references.

WOKER, GERTRUD. Oxydationsfermente. *In her Die Katalyse. Biologische Katalysatoren*, 1931: 201-536. Extensive bibl. footnotes.

OXIDATION

AUBEL, E., and GENEVOIS, L. Oxidation-reduction. *Rev. gén. bot.* 40: 53-62, 120-127, 184-189, 244-251 (1928). 65 references.

Hewitt, L. F. Oxidation reduction potentials in bacteriology and biochemistry. London, County Council, 1931, 70 p. Bibl., p. 59-62.

JORISSEN, W. P. Autoxidation boundary pressure—especially that of phosphorus. *Chem. News* 138: 101-102, 116 (1929). 76 references.

MAYER, ANDRÉ, and NICHITA, GEORGE. Sur l'action hyperthermisante et oxydoréductrice du Bleu de méthylène. *Ann. physiol.* 4: 970-974 (1928).

MICHAELS, LEONOR. Oxydations-Reductions-Potentiale mit besonderer Berücksichtigung ihrer physiologischen Bedeutung. Berlin, Springer, 1929. 171 p. Bibl., p. 162-169. English edition, Philadelphia, Lippincott, 1930. 199 p. Bibl., p. 187-197.

MILAS, NICHOLAS A. New views on auto-oxidations. *J. Phys. Chem.* 33: 1204-1216 (1929). 63 footnotes.

Oxidation, physiological. *Index-Cat.*, S. G. O., 3rd ser., 8: 533-534 (1929). 61 references.

THUNBERG, TORSTEN. Die biologischen Reduktions - Oxydations - Potentiale (Redox-Potentiale). *In* Oppen-

heimer, *Handb. Biochem.*, 2. Aufl., Ergänzungsband: 213-244 (1930). 79 footnotes.

THUNBERG, TORSTEN. Der jetzige Stand der Lehre vom biologischen Oxydationsmechanismus. *In* Oppenheimer, *Handb. Biochem.*, 2. Aufl., Ergänzungsband: 245-281 (1930). 267 footnotes.

OXIDES *

FRICKE, R. Einige Gesichtspunkte zu den Wandlungen der Oxyhydrate. *Kolloid-Z.* 49: 229-243 (1929). 79 footnotes.

OXIMES *

PONZIO, G. Ricerche sulle diossime. *Gazz. chim. ital.* 60: 49-96 (1930). 187 footnotes.

OXONIUM COMPOUNDS

KEHRMANN, F. Oxonium-Verbindungen. *In* Houben, *Meth. org. Chem.*, 3. Aufl., 3: 458-528 (1930). Bibl. footnotes.

See also ORGANIC CHEMISTRY (Pfeiffer).

OXYGEN

Oxygen, physiological aspects of. *Index-Cat.*, S. G. O., 3rd ser., 8: 535-536 (1929). 40 references.

See also GASES: INDUSTRIAL.

OZONE

FONROBERT, EWALD. Ozonide. *In* Houben, *Meth. org. Chem.*, 3. Aufl., 3: 406-457 (1930). Bibl. footnotes.

Ozone. *Index-Cat.*, S. G. O., 3rd ser., 8: 544-545 (1929). Includes therapeutics of ozone and its use as a disinfectant. 62 references.

RIESENFELD, E. H. Die Bildung und Zersetzung von Ozon. *Z. angew. Chem.* 42: 729-734 (1929). 30 footnotes.

PAINTS

BROWNE, F. L. Paint thinners. *Ind. Eng. Chem.* 23: 874 (1931). 26 references.

CAME, C. L. Durability tests of spar varnishes. *Bur. Standards J. Research* 4: 258-259 (1930). 28 references.

COFFIGNIER, CHARLES. Couleurs et peintures. Paris, Baillière, 1924. 762 p. Bibl. footnotes.

CURTIS, C. A. Künstliche organische Pigmentfarben und ihre Anwendungsgebiete. Berlin, Springer, 1930. 230 p. Abstracts of patents, 104-139 (classified); coal tar dyes used as pigments: patents 166-221. Patent index, 223-225.

ELM, A. C. Drying and yellowing of trilinolenic glyceride. *Ind. Eng. Chem.* 23: 886-887 (1931). 63 references.

GARDNER, HENRY A. Physical and chemical examination of paints, varnishes, lacquers and colors. 5th ed. Washington, Inst. Paint Varnish Research, 1930. 952 p. Includes bibls.

HEATON, NOEL. Outlines of paint technology. London, Griffin, 1928. 400 p. Bibl., p. 373-376.

VAN HOEK, C. P. Die Weisspigmente und ihr Verhalten gegenüber ultraviolett Strahlen. Farben-Ztg. 34: 1008-1009 (1929). 88 references.

KEMPF, R. Ueber das Abkreiden. Farben-Ztg. 36: 20-22 (1920). 30 footnotes.

MEIER, H. Die deutschen Patente über Zinkoxydfarben. Farben-Ztg. 36: 1560-1561 (1931).

MORRELL, R. S. Progress of the paint and varnish industry during 1927. Ind. Chemist 4: 8-10 (1928). Bibl. through text.

SOCIETY OF CHEMICAL INDUSTRY. Paints, pigments, varnishes and resins. In Reports on the progress of applied chemistry 14: 369-399 (1929); 340 footnotes. 15: 400-444 (1930); 357 footnotes.

VANINO, L., and ROTHSCCHILD, S. Ueber die Verwendung von Leuchtfarben. Chem.-Ztg. 55: 477-478, 498-500 (1931). 32 footnotes.

WAGNER, HANS. Neuere Tendenzen in der Körperfarbenfabrikation. Kolloid-Z. 54: 112-117 (1931). Patent review.

WOLFF, HANS. Oele, Harze, Lacke. Kolloid-Z. 49: 210-217 (1929). 89 footnotes.

WOLFF, HANS. Uebersicht über die Literatur der Anstrichstoffe und ihre Rohstoffe im Jahre 1927. Chem. Umschau Fette, Oele, Wachse Harze 35: 218-221, 228-232, 256-258 (1928). Bibl. through text.

PALLADIUM

FRITZMAN, E. Palladium hydride and its catalytic properties. Zhur. Prikladnoi Khim. 3: 455-500 (1930). 150 references.

SIRK, H. Palladium. In Doelter, Handb. Mineralchem. 3, pt. 2: 1136-1153 (1926). Bibl. footnotes.

PALM OIL *

BARNES, ARTHUR C. Chemical investigations into the products of the oil palm. Nigeria, Agr. Dept., Special Bull. No. 1. 75 p. Bibl., p. 74-75.

DE BELSUNCE, G. Huile d'amande de palme. Huile de palme. Bull. mat. grasses inst. colonial Marseille 1929: 3-34. References through text.

PANCREAS

BALL, ERIC G. The composition of pancreatic juice and blood serum. J. Biol. Chem. 86: 447-448, 462, 653 (1930). 64 references.

BOLDYREFF, EPHRAIM B. Die Sekretion des Pankreassaftes - ein glykolytischer Faktor im Blut. Arch. ges. Physiol. 218: 553-567 (1928). Bibl. footnotes.

BOLDYREFF, W. N. Die periodische Tätigkeit des Organismus und ihre physiologische Bedeutung. Ergebnisse Physiol. 29: 485-486, 515, 527-528, 548-549, 551-552, 575, 583-584, 596, 598, 617, 624-625, 631-632, 636 (1929). 267 references.

HERXHEIMER, G. Pankreas. In Hirsch, Handb. inneren Sekretion 1: 105-122 (1926?).

MARX, HANS. Die anorganischen Bestandteile von Pankreas und Nebennieren. Biochem. Z. 179: 425 (1926). 25 references.

Pancreas, chemistry of, extract of, ferments of, juice of, physiology of. Index-Cat., S. G. O., 3rd ser., 8: 570, 575-576, 584, 586-587, 587-589 (1929).

PETSCHACHER, LUDWIG. Ueber die Chemie des Pankreas. Biochem. Z. 141: 119-120 (1923). 60 references.

ROSENBERG, MAX. Normale und pathologische Physiologie der inneren Pankreassekretion. In Hirsch, Handb. inneren Sekretion 2: 1131-1142 (1929). 710 references.

SIMON, HANS. Die Ergebnisse und Methoden der Pankreasfunktionsprüfung. Ergebnisse inneren Medizin u. Kinderheilkunde 32: 83-89 (1927).

See also DIGESTION (Ivy); PHARMACEUTICALS (Munch).

PANTOPON *

Pantopon. Index-Cat., S. G. O., 3rd ser., 8: 595-596 (1926). 54 references.

PAPER AND PULP

BIALKOWSKY, H. W. Hydration - Bibliography. Bull. Inst. Paper Chem. 1, no. 4: 14-21 (1930).

BERNDT, K. Aufschluss von Kiefernholz nach dem Bisulfitverfahren. Papierfabr. 28: 313-319 (1930). 55 footnotes.

BERNDT, K. Die Bestimmung des Aufschlussgrades von Zellstoffen. Papierfabr. 29: 437-447 (1931). 68 footnotes.

BERNDT, K. Magnesiahaltige Bisulfitlaugen. Papierfabr. 27: 565-569 (1929). 38 footnotes.

Bibliography of periodical publications on papermaking and allied subjects.

PAPER AND PULP—*Cont'd*

1927. 40 p. 1928. 40 p. 1929. 39 p. 1930. 44 p. London, Technical Section, Papermakers' Assoc. Gt. Britain Ireland.
- CABLE, DONALD E. Bibliography of wood pulp strength testing. *Paper Trade J.* 92, no. 9: 35-39 (Feb. 26, 1931).
- CASSIDAY, W. L. Bibliography of starch in its relation to the manufacture of paper. *Bull. Inst. Paper Chem.* 1, no. 9: 23-37 (1931).
- Effect of bleaching on the physical and chemical constants of pulps—Bibliography. *Bull. Inst. Paper Chem.* 1, no. 6: 16-25 (1931).
- KARLBERG, R. Determining the bleachability of paper. *Svensk Pappers-Tid.* 33: 558-566 (1930); *Papier* 34: 385-398 (1931); *Paper Trade J.* 92, no. 11: 41-44 (1931). References through text.
- LAUGHLIN, E. R. Permanence and durability of paper. *Bull. Inst. Paper Chem.* 1, no. 8: 19-30 (1931).
- MATAGRIN, A. L'Imperméabilisation des papiers et cartons. *Papeterie* 49: 532-549, 594-598, 641-645, 730-734, 789-790, 826, 830, 937-938, 973-977, 1032-1034, 1077-1081, 1118, 1121 (1927); 50: 10-14, 106-112, 166-170, 213-214, 262-269, 366-373, 418, 421, 481, 581-582, 637-641, 694-698, 754-758, 818-822, 874-882, 926-930, 986-990, 1222-1229, 1282-1289 (1928); 51: 2-10, 58, 61, 178, 181, 294, 297, 430-434, 490-494, 546-550, 741-745, 895-896, 921-925, 1049-1053, 1117-1122, 1169-1173, 1297-1301, 1373-1377, 1433-1434 (1929); 52: 134-142, 209-213, 337-338, 474-480, 585-590, 654-661, 717-721, 790-794, 1385-1386, 1518-1522 (1930); 53: 94-97, 157-162, 290-294, 441-445, 502-509, 554-561, 701-708, 761-765 (1931). 791 references.
- MOORE, W. F. Bibliography of wood pulp strength testing. *Paper Trade J.* 89, no. 12: 62-72 (1929). 63 references, annotated.
- MOOSDORF, WALTER. Sammelreferat über die in deutschen Fachzeitschriften erschienene Literatur zur Chemie der Cellulose und der Papier- und Zellstoff-Fabrikation für den Zeitraum von 1. Oktober 1927 bis 31. März 1928. *Tech. Chem. Papier- u. Zellstoff-Fabr.* 25: 52-59 (1928). 64 references. 1. April bis 31. Dezember 1928. 26: 96-102, 113-120 (1929). 161 footnotes. 1. Januar bis 30. June 1929. 27: 37-43, 71-76, 88-95 (1930); 217 footnotes. 1. Juli bis 31. Dezember 1929. 27: 153-166 (1930); 215 footnotes.
- MÜLLER, FR., and WALLIN, PAUL. Kritische Untersuchungen des fabriktions-technischen Entwicklung in der Sulfitzellstoff-Fabrikation auf Grund der bestehenden Literatur in den letzten Jahren. *Wochbl. Papierfabr.* 1929, Special No., 73-81; 60: 885-889, 1016-1021, 1203-1206, 1529-1534 (1929); 61: 109-112, 412-416, 669-672 (1930). 216 footnotes.
- OBERMANN, HENRY E. Bibliography of the effect of hydration and dryer temperature on sizing. *Bull. Inst. Paper Chem.* 1, no. 10: 23-29 (1931).
- VON POSSANNER, B., and KRAUSS, R. A. Ueber die Bestimmung der Bleichfähigkeit bzw. des Aufschlussgrades von Sulfitzellstoffen. *Papierfabr.* 29: 317-318 (1931). 196 references.
- PREBLE, B. Suitability of eucalyptus for paper pulp. *Paper Trade J.* 88, no. 26: 59-60 (1929).
- "Pulp evaluation." *Proc. Tech. Sect., Papermakers' Assoc. Gt. Britain Ireland* 10, pt. 1: 37-42 (1929). 68 references.
- RAUCHBERG, HERBERT. Chlorgasbleiche und Chlorkalkbleiche des Sulfitzellstoffes. *Papierfabr.* 29: 490-497, 516-524, 535-541 (1931). 102 footnotes.
- RIESENFELD, E. H., and HAMBURGER, T. Chemische Bestimmung des Holzschliffgehaltes im Papier. *Cellulosechemie* 10: 125-134 (1929). 55 footnotes.
- ROSSMAN, JOSEPH. Asphalt emulsions in paper making. *Paper Trade J.* 89, no. 21: 53-56 (1929). 45 patents.
- ROSSMAN, JOSEPH. Cornstalks in paper making. *Paper Trade J.* 91, no. 23: 51-54 (1930). 45 patents. Annotated.
- ROSSMAN, JOSEPH. Decorated paper. *Paper Trade J.* 90, no. 18: 64-69 (1930). 81 patents. Annotated.
- ROSSMAN, JOSEPH. Fireproofing paper and boards. *Paper Trade J.* 91, no. 9: 42-43 (1930); *Paper Making* 49: 348-350 (1930). 25 patents.
- ROSSMAN, JOSEPH. The manufacture of waxed paper. *Paper Trade J.* 90, no. 5: 56-65 (1930). 135 patents. Annotated.
- RUNKEL, ROLAND. Neuzeitliche Probleme der Papierfaserstoffgewinnung und Wege zu ihrer Lösung. *Tech. Chem. Papier- u. Zellstoff-Fabr.* 27: 81-88, 97-110 (1930). 80 footnotes.
- SCHMID, W. Uebersicht über die in- und ausländische Patentliteratur, betreffend die Verwertung und Aufarbeitung der Abgaben und Abgase der Zellstoffindustrie (von 1925-1930). *Papierfabr.* 28: 573-575, 587-590, 620-623, 636-639, 671-672 717-719, 744-

- 746, 875-877 (1930); 29:10-14 (1931). 1930-1931. 29:665-670 (1931). Annotated patent list.
- SCHWALBE, HELLMUTH. Die Bereitung des Papierganzstoffes. Bd. I, Teil 2 of Technik und Praxis der Papierfabrikation. Berlin, Elsner, 1931. 464 p. Over 1000 bibl. footnotes. Includes beating, sizing, fillers and dyeing.
- SOCIETY OF CHEMICAL INDUSTRY. Fibres, textiles, cellulose and paper. In Reports on the progress of applied chemistry 14:133-154 (1929); 126 footnotes. 15:145-169 (1930). 135 footnotes.
- United States patents on papermaking, 1927-1931. Wochbl. Papierfabr. 61, no. 8:251-254; no. 11:357-359; no. 16:528-532 no. 20:646-647; no. 24:774-775; no. 30:973; no. 32:1046-1047; no. 38:1233; no. 41:1318-1319; no. 44:1412; no. 47:1505; no. 50:1626; no. 51:1659 (1930); 62, no. 3:51-52; no. 11:258-259; no. 18:432-433; no. 22:535-537; no. 29:698-699; no. 31:748-749; no. 33:791-792; no. 36:867-868; no. 42:996-997 (1931).
- WALTON, ROBERT P. Causes and prevention of deterioration in book materials. Paper Trade J. 89, no. 6:53-58 (1929). Abstracted from Bull. N. Y. Public Library 33:235-266 (1929).
- WEST, CLARENCE J. Bibliography of papermaking for 1928. Paper Trade J. 88, no. 8:173-231 (1929); Tech. Assoc. Papers 12:147-177 (1929). 1929. Paper Trade J. 90, no. 8:197-259 (1930); Tech. Assoc. Papers 13:147-181 (1930). 1930. Paper Trade J. 92, no. 8:145-185; no. 9:40-46; no. 10:47-54 (1931); Tech. Assoc. Papers 14:392-429 (1931).
- WEST, CLARENCE J. Paper research literature. I. List of contributions by members of the Forest Products Laboratory on pulp and paper, 1910-1928. Paper Trade J. 89, no. 1:56-62 (1929).
- WEST, CLARENCE J. United States Patents on papermaking, 1928. Paper Trade J. 86, no. 18:68; 87, no. 5:58-59; no. 16:37-38 (1928); 88, no. 6:53-54 (1929); Tech. Assoc. Papers 12:191-195 (1929). 1929. Paper Trade J. 88, no. 16:61-62; 89, no. 5:54-56; no. 17:53-54 (1929); 90, no. 6:74-75 (1930); Tech. Assoc. Papers 13:292-299 (1930). 1930. Paper Trade J. 90, no. 19:55-56; 91, no. 4:54-56; no. 17:41-42 (1930); 92, no. 6:61-62 (1931); Tech. Assoc. Paper 14:430-437 (1931). 1931.
- Paper Trade J. 92, no. 22:36-38; 93, no. 6:43-45; no. 17:35-37 (1931).
- WEST, CLARENCE J. Waste liquors and gases of the paper industry. A survey of recent domestic and foreign patent literature on the utilization of waste liquors and waste gases of the pulp industry, 1925-1930. Paper Trade J. 92, no. 3:48-56; no. 4:50-56; no. 5:46-51 (Jan. 15, 22, 29, 1931).
- WILLETS, WILLIAM R. Hydrogen ion methods in the paper industry. Paper Trade J. 93, no. 1:40-41 (1931). 94 references.
- See also BLEACHING, CELLULOSE, CORNSTALKS, SIZING.
- Serial*
- Bulletin of the Institute of Paper Chemistry, Appleton, Wis. 1+. 1930+.
- PARACHOR ***
- SIPPEL, A. Ueber den Parachor, eine Anwendung der Oberflächenspannung zur Konstitutionserforschung chemischer Verbindungen. Z. angew. Chem. 42:849-852, 873-877 (1929). 58 footnotes; 24 references on p. 876-877.
- SUGDEN, SAMUEL. The parachor and valency, London, Routledge, 1930. 224 p. Bibl., p. 190.
- PARATHYROID GLAND ***
- COLLIP, J. B. Physiology of the parathyroid glands. Can. Med. Assoc. J. 24:653 (1931). 37 references.
- Parathyroid glands, extract of. Index-Cat., S. G. O., 3rd ser., 8:686 (1929). 36 references.
- See also THYROID GLAND.
- PEACHES ***
- NIGHTINGALE, G. T., ADDOMS, R. M., and BLAKE, M. A. Development and ripening of peaches as correlated with physical characteristics, chemical composition and histological structure of the fruit flesh. III. Macrochemistry. N. J. Agr. Expt. Sta., Bull. 494. 1930. 16 p. Bibl., p. 14-16. 43 references.
- PEANUTS ***
- LYNCH, D. F. J. The peanut industry. J. Chem. Education 7:794-811, 1037-1050, 1277-1290, 1617-1631, 1859-1868 (1930). 126 footnotes.
- PEAT**
- ADOVA, A. N., and SMORODINZEW, I. A. Sur la modification artificielle de la réaction actuelle des eaux dans la lutte avec les larves d'anophèles et sur la capacité absorbante de la tourbe. Bull. soc. chim. biol. 12:227-230 (1930). 48 references.

PEAT—Cont'd

FEUSTEL, IRVIN C., and BYERS, HORACE G. The physical and chemical characteristics of certain American peat profiles. U. S. Dept. Agr., Tech. Bull. No. 214. 1930. 27 p. Bibl., p. 24-26.

STADNIKOFF, G. Neuere Torfchemie. Dresden, Steinkopff, 1930. 167 p. Numerous bibl. footnotes.

WAKSMAN, SELMAN A. Chemical composition of peat and the rôle of microorganisms in its formation. Am. J. Sci. 19: 53-54 (1930). 43 references.

WAKSMAN, S. A., and STEVENS, K. R. Chemical composition of peat. V. Rôle of microorganisms in peat formation and decomposition. Soil Science 28: 338-340 (1929). 47 references.

PECTIN

BRANTFOOT, M. H. A critical and historical study of the pectic substances of plants. Dept. Sci. Ind. Research, Food Investigation, Special Report No. 33. London, H. M. Stationery Off., 1929. 154 p. Bibl., p. 139-154.

EHRLICH, FELIX. Ueber die Chemie des Pektins und seine Beziehungen zur Bildung der Inkrusten der Cellulose. Cellulosechemie 11: 140-151, 161-170 (1930). About 100 footnotes.

EHRLICH, FELIX, and KOSMAHL, ALFRED. Ueber die Chemie des Pektins der Obstfrüchte. Biochem. Z. 212: 162-239 (1929). 45 footnotes.

EHRLICH, FELIX, and SOMMERFELD, ROBERT V. Die Zusammensetzung der Pektinstoffe der Zuckerrübe. Biochem. Z. 168: 263-323 (1928). Bibl. footnotes.

NELSON, E. R., and MOTTERN, —. Pectin. Fruit Products J. 10: 141-142 (1931).

NORMAN, A. GEOFFREY. Biochemistry of pectin. Science Progress 24: 278-279 (1929). 57 references.

ZEMPLÉN, GÉZA. Pektinstoffe. In Abderhalden, Biochem. Handl. 13: 41-51 (1931). Biol. footnotes.

PELLAGRA *

Pellagra. Index-Cat., S. G. O., 3rd ser., 8: 756-763 (1929).

PEPSIN

MOZOŁOWSKI, W., and HILAROWICZ, H. Ueber das Wesen des sogenannten Serumantipepsins. Biochem. Z. 164: 295-311 (1925). 56 footnotes.

Pepsin and peptic digestion. Index-Cat., S. G. O., 3rd ser., 8: 792-794 (1929).

PEPTIDASES *

GRASSMANN, WOLFGANG, and HEYDA, WERNER. Zur Kenntnis der Peptidasen des Blutserum. Z. physiol. Chem. 188: 69-80 (1930). 42 footnotes.

GRASSMANN, WOLFGANG, and KLENK, LUDWIG. Zur Frage der Einheitlichkeit tierischer und pflanzlicher Dipeptidase. Z. physiol. Chem. 186: 26-49 (1929). 50 footnotes.

PEPTONES

Peptones. Index-Cat., S. G. O., 3rd ser., 8: 794-795 (1929). 56 references.

PERFUMES

BOGERT, M. T. Recent progress in the field of synthetic perfumes. J. Chem. Education 8: 1333-1334 (1931). 64 references.

REDGROVE, H. STANLEY. Scent and all about it; a popular account of the science and art of perfumery. London, Heinemann, 1928. 99 p. Bibl., p. 93-95.

WAGNER, ALFRED. Die Parfümerie-industrie. Halle, Knapp, 1928. 596 p. Bibl. (including patents) for 1925-1928, p. 540-557; Bibl., p. 558-561.

See also ALDEHYDES, ESSENTIAL OILS.

PERIODICITY *

COPISAROW, MAURICE. Periodizität und ihre Grundlagen. Kolloid-Z. 54: 257-265 (1931). 45 references.

PERMEABILITY

GELLHORN, ERNST. Das Permeabilitätsproblem. Berlin, Springer, 1929. 441 p. Bibl., p. 386-443.

OSTERHOUT, W. J. V. Some aspects of permeability and bioelectrical phenomena. Nat. Research Council, Bull. 69: 221-228 (1929). 81 references. Annotated.

PRÁT, SILVESTER. Plasmolyse und Permeabilität. Biochem. Z. 128: 567 (1922). 26 references.

WERTHEIMER, ERNST. Permeabilitätsstudien an einem überlebenden Membran. Fortschritte Naturwiss. Forschung, N. F., No. 2. 1927. 25 p. Bibl. footnotes.

WIERINGA, K. T. Quantitative Permeabilitätsbestimmung. Protoplasma 8: 578-584 (1929). 149 references.

PEROXIDASE *

GRIMMER, W., and ENGEL, H. Zur Kenntnis der Milchperoxydase. Milchwirts. Forschung 10: 295-296 (1930). 30 references.

See also OXIDASE (Woker).

PEROXIDES

SONN, A. Superoxyde. *In* Houben, Meth. org. Chem., 3. Aufl., 3: 366-405 (1930). Bibl. footnotes.

PERSPIRATION

BENEDICT, FRANCIS G., and BENEDICT, CORNELIA G. Perspiratio insensibilis: Ihr Wesen und ihre Ursachen. Biochem. Z. 186:287-312 (1927). 100 bibl. footnotes.

Perspiration. Index-Cat., S. G. O., 3rd ser., 8: 842-843 (1929).

PERYLENE

MASON, FREDERICK A. Chemistry of perylene. *Ind. Chemist* 5:114, 140 (1929). 63 references.

PETROLEUM

ARNOLD, RALPH, and KAMNITZER, WM. J. Petroleum in the United States and possessions. New York, Harper, 1931. 1052 p. Bibls., by states, throughout the book. Author and subject indexes to these bibls., p. 997-1031.

BARBAUDY, JEAN. La fabrication industrielle de l'alcool absolu. *Ann. combustibles liquides* 3:191-218 (1928). 43 footnotes.

BELL, HAROLD S. American petroleum refining. 2d ed. New York, Van Nostrand, 1930. 631 p. Contains references.

BENTZ, ALFRED, *et al.* Deutsches Erdöl. Stuttgart, Enke, 1931. 150 p. Bibl., p. 147-148.

BERL, E. Ueber Bildungs- und Verbrennungsvorgänge von Brennstoffen. *Petroleum* 27:399-407 (1931). 49 footnotes.

BORGSTROM, P., and REID, E. E. Sulfur compounds in mineral oils. *Oil Gas J.* 26:352-353 (1927). 58 references.

BRANNER, GEORGE C. An outline of the petroleum and natural gas resources of Arkansas. Little Rock, Ark., 1927. 47 p. Bibl. of petroleum, p. 34-36; of gas, 46.

BRITTON, H. Bibliography of petroleum and allied substances, 1922-1923. U. S. Bureau of Mines, Bull. 290. 1929. 667 p. 7914 references.

CARPENTER, J. A. Special products. 1928-1929. *J. Inst. Petroleum Tech.* 16:284-312 (1930). 135 footnotes. Classified list of patents, p. 306-312.

CHALLENGER, F. Sulfur compounds of shale oil and petroleum. *J. Soc. Chem. Ind.* 48:626-627 (1929); *Brennstoffchem.* 10:279 (1929). 32 references.

CHARTROU, J. J. Pétroles naturel et artificiels. Paris, Colin, 1931. 206 p. Bibl., p. 203-204.

CROSS, ROY. Handbook of petroleum, asphalt and natural gas. 1931 ed. Kansas City, Mo., Kansas City Testing Lab., 1931. 864 p. Patents and publications, p. 757-799.

ECKHART, W. R. Progress in petroleum engineering. *Mech. Eng.* 47:1126-1132 (1925). 100 footnotes.

EGLOFF, G., LOWRY, C. D., JR., and SCHAAD, R. E. Cracking. *J. Inst. Petroleum Tech.* 16:133-246 (1930). 166 footnotes. About 400 patents abstracted.

EMMONS, WILLIAM H. E. Geology of petroleum. 2d ed. New York, McGraw-Hill, 1931. 736 p. Includes bibls.

ENGLER, KARL O. V. Das Erdöl. 2. Aufl. Leipzig, Hirzel, 1930+. Contains bibls.

FARAGHER, W. F., MORRELL, J. C., and LEVINE, I. M. Determination of olefin and aromatic hydrocarbons. *Ind. Eng. Chem., Anal. Ed.* 2:23-24 (1930). 105 references.

FISCHER, F. Ueber die Entwicklung unserer Benzinsynthesen aus Kohlenoxyd und Wasserstoff bei gewöhnlichem Druck. *Brennstoffchem.* 11:489-490 (1930). 22 references, covering 1926-1930.

FRIEDMANN, W. Ueber Schwefelöle, ihre Entstehung und ihre Verarbeitung, sowie ihre Beziehungen zur Asphaltbildung. *Erdöl und Teer* 6:285-286, 301-303, 342-344, 359-363 (1930). 79 footnotes.

GRAETZ, ANDRÉ. Sur quelques réactions d'autoxydation des essences. *Ann. combustibles liquides* 3:69-76 (1928). 30 references.

GRAETZ, ANDRÉ. Tendances actuelles de l'industrie du cracking. *Ann. combustibles liquides* 3:779-832 (1928). 187 footnotes.

HOLDE, D., *et al.* Technische Analyse der flüssigen und festen Erdölprodukte. *In* Engler, Das Erdöl, 2. Aufl., pt. 4:17-384 (1930). Bibl. footnotes.

HOWES, D. A. Chemical examination of gasoline and light mineral oils. *J. Inst. Petroleum Tech.* 16:85-88 (1930).

HUGEL, — and STONESCU, —. Action de l'acide sulfurique au cours du raffinage chimique des huiles minérales sur les matières asphaltiques. *Ann. combustibles liquides* 5:798-799 (1929). 37 references.

JILLSON, WILLARD R. Oil and gas in Western Kentucky. *Ky. Geol. Survey, Ser. VI. Geologic Reports vol. 39.* 1930. 632 p. Bibl., p. 619-627.

PETROLEUM—Cont'd

- JOLEAUD, LEONCE. Le pétrole dans l'Afrique du Nord. Paris, La Revue pétrolifère, 1926. 191 p. Bibl., p. 174-184.
- KELLY, C. I. Analysis and testing (petroleum products, 1928-1929). J. Inst. Petroleum Tech. 16: 333 (1930). 30 references.
- KISSLING, R. Chemisch-technische Fortschritte auf dem Gebiete der Erdölindustrie im Jahre 1929. Teer u. Bitumen 28: 472-473 (1930). 42 references.
- KISSLING, R. Die Erdölindustrie. 1928. Chem. Umschau Fette, Oele, Wachse Harze 36: 310-314, 324-330 (1929). 424 references. Erdöl u. Teer 5: 275-276, 299-300, 322-324, 348-351 (1929). 433 footnotes. Fortschrittsber. Chem.-Ztg. 1929: 61-68. 437 footnotes. List of books, p. 68. 1929. Fortschrittsber. Chem. Ztg. 1930: 73-80. 482 footnotes. Chem. Umschau Fette, Oele, Wachse Harze 37: 177-182, 208-213, 223-226 (1930). 557 references. List of books, p. 224-225. Erdöl u. Teer 6: 606-608 (1930); 7: 10-12, 27-30 (1931). 568 footnotes. 1930. Chem. Umschau Fette, Oele, Wachse Harze 38: 140-144, 191-195, 230-235 (1931). 621 references.
- KISSLING, RICHARD. Uebersicht über die Patentliteratur der Erdölindustrie des Jahres 1926. Petroleum 23: 861-864 (1927). Classified.
- KOETSCHAU, RUDOLF. Erdöl und verwandte Stoffe. In Doelter, Handb. Mineralchem. 4: 644-792 (1930). Books, p. 650-652. Bibl. footnotes.
- KREJCI-GRAF, KARL. Geochemie der Erdöllagerstätten erläutert an den rumänischen Vorkommen. Halle, Knapp, 1930. 54 p. Bibl., p. 50-54.
- LOTTERMOSER, A., and CALANTAR, NICOLAS. Die technischen Zerstörungsmethoden der Rohölemulsionen. Kolloid-Z. 48: 179-184 (1929). 63 footnotes.
- MACFARLANE, JOHN M. The quantity and sources of our petroleum supplies; a review and a criticism. Philadelphia, Noel Printing Co., 1931. 250 p. Bibl., p. 241-244.
- MARGOSCHES, B. M., KRAKOWETZ, B., and SCHNABEL, F. Jodzahlstudien an Produkten der Mineralölindustrie. Petroleum 25: 1179-1186 (1929). 53 footnotes.
- MORRELL, J. S., and EGLOFF, G. Colloid chemistry of petroleum. In Alexander, Colloid Chemistry III: 522 (1931). 48 references.
- MRAZEC, L. Vorlesungen über die Lagerstätten des Erdöls. Petroleum 22: 839-850, 901-909 (1926). 72 footnotes.
- NASH, ALFRED W. Synthetic fuels. 1928-1929. J. Inst. Petroleum Tech. 16: 313-324 (1930). Patents and references through text.
- NOWAK, JAN. Die Geologie der polnischen Oelfelder. Stuttgart, Enke, 1929. 94 p. Bibl., p. 92-94.
- PERRY, EUGENE S. The Kevin-Sunburst and other oil and gas fields of the Sweetgrass arch. Montana, State Bur. of Mines and Met., Memoir 1. 1928. 41 p. Bibl., p. 39-41. Mimeographed.
- PINCASS, HEINRICH. Katalysatoren für Krackprozesse. Metallbörse 18: 957-958 (1928). Patents through text.
- PONTONIÉ, ROBERT. Zusammenstellung der Daten, die für die organische Herkunft des Erdöls sprechen. Petroleum 23: 395-399 (1927). 14 footnotes.
- RAKUSIN, M. A. Literatur über die Cholesterinfrage in der Erdölchemie seit 1906. Petroleum 24: 901-902 (1928). 29 references.
- Report III of the Federal Oil Conservation Board to the President of the United States. Washington, 1929. 218 p. Bibl., p. 192-218.
- RUE, H. P., and ESPACH, R. H. Refining of light petroleum distillates. U. S. Bur. Mines, Bull. No. 333. 1930. 111 p. Bibl. footnotes.
- SALADINI, B. La raffinazione degli olii minerali e l'uso industriale in essa del cloruro d'aluminio anifro. Ind. chimica 4: 1038 (1929). 62 references.
- SCHUFTAN, PAUL. Analyse gasförmiger Erdölprodukte. In Engler, Das Erdöl, 2. Aufl., 4: 385-453 (1930). Bibl. footnotes.
- SEDLACZEK, ERWIN. Die Krackverfahren unter Anwendung von Druck (Druckwärmespaltung). Berlin, Springer, 1929. 402 p. Digest of patents covering the cracking processes.
- SEDUIKH, N. Cracking in the vapor phase. Neftyanca Khozyaistvo 15: 677-691 (1928).
- SINGER, L. Allgemeines über Vorbehandlung und Entwässerung von Oelen. Petroleum 26: 868-870 (1930). 36 footnotes.
- SINGER, L. Erdöl. In Ullman, Enzyk. tech. Chem., 2nd ed., 4: 495-602. References through text; bibl. p. 601-602.
- SINGER, L. Fortschritte in der Krackdestillation. Petroleum 25: 741-748, 849-850, 986-990, 1025-1026, 1051-1052 (1929). 130 references and 194 patents.

- SINGER, LEOPOLD. Neuere aus der Krackindustrie. *Petroleum* 25: 1216-1219, 1316-1321, 1396-1404, 1441-1443 (1929). 345 footnotes.
- SINGER, LEOPOLD. Neues über das Entfärbung von Mineralölen. *Petroleum* 26: 1220-1222 (1930). 20 footnotes; numerous patent references in text.
- SINGER, L. Neuere Fortschritte in der Destillationstechnik. *Petroleum* 25: 1141-1146, 1164-1168, 1191-1196 (1929). 371 footnotes.
- SINGER, LEOPOLD. Neuere über Treibmittel. *Petroleum* 25: 109-120, 152-153, 513-524 (1929). 466 footnotes.
- SOCIETY OF CHEMICAL INDUSTRY. Mineral oils. In Reports of the progress of applied chemistry 14: 90-103 (1929); 31 footnotes. 15: 95-108 (1930); 42 footnotes.
- THOM, WILLIAM T. Petroleum and coal; the keys to the future. Princeton, Princeton Univ. Press, 1929. 223 p. Bibl., p. 219-223.
- TYPKE, —. Ueber die Anwendung der Raffinationsmittel Lauge und Schwefelsäure. *Petroleum* 22: 751-756, 774-778 (1926). 111 footnotes.
- TYPKE, —. Ueber die Herstellung der Transformatoren- und Schalteröle. *Petroleum* 25: 819-824 (1928). 33 footnotes.
- VAVON, G., and ZAHARIA, N. Sur les "E-phenols" du goudron primaire. *Ann. combustibles liquides* 3: 549-551 (1928). 28 references.
- VOITESHTI, I. P. Résumé sur les considérations regardant le genèse du pétrol. *Mon. Pétrole roumain* 34: 969-970 (1925). 47 references.
- VER WIEBE, WALTER A. Oil fields in the United States. New York, McGraw-Hill, 1930. 639 p. Includes selected bibliography.
- WEIGELT, JOHANNES. Die Beziehungen zwischen permischer Salzfolge und Erdöl in Nordwest-Deutschland. *Kali* 21: 195 (1927). 64 references.
- WILSON, ROBERT E. Significance of tests for motor fuels. *S. A. E. J.* 27: 41-42 (1930). 47 references.
- ungen für Apotheker. Berlin, Springer, 1930. 81 p. Bibl., p. 77-78.
- HOUBEN, J. Fortschritte der Heilstoffchemie. Berlin, de Gruyter. Vol. I, 1877-1900. 1926. Vol. II, 1901-1907. 1927. Vol. III, 1908-1912. 1927. Vol. IV, 1913-1917. 1928. Vol. V, 1918-1925. 1929. 995 p. Vol. VI, 1925-1928. 1931. 1300 p. Patents reproduced; classified by groups.
- JENKINS, GLENN L., and DU MEZ, ANDREW G. Quantitative pharmaceutical chemistry, containing theory and practice of quantitative analysis applied to pharmacy. New York, McGraw-Hill, 1931. 408 p. Bibl. in introduction; references at the end of some of the chapters.
- LEBEAU, PAUL. *Traité de pharmacie chimique*. 2 v. Paris, Masson, 1929. Bibl. footnotes.
- LLOYD, JOHN URI. Origin and history of all the pharmacopoeial vegetable drugs, 8th and 9th decennial revisions, with bibliography. 2nd ed. Cincinnati, Caxton, 1929. 449 p. Bibl., p. 357-424.
- LOMHOLT, SVEND. Different preparations of bismuth in syphilis therapy. *British Med. J.* 1928, II: 891. 43 references.
- MAYER, R. L. Therapeutische Neuheiten und ihre wissenschaftlichen Grundlagen. *Fortschrittsber. Chem.-Ztg.* 1930: 1-6. References through text.
- MAZZI, V. Copper in medicine and industrial pathology. *Rass. clin. terap. sci. affini* 27: 192-212 (1928).
- Pharmacy. *Index-Cat., S. G. O.*, 3rd ser., 8: 868-875 (1929).
- RABOW, S. Uebersicht der in Laufe des Jahres 1928 bekannt gewordenen therapeutischen Neuheiten einschliesslich der Spezialitäten und Geheimmittel. *Fortschrittsber. Chem.-Ztg.* 1929: 33-37. 162 footnotes.
- See also CHEMOTHERAPY.
- Serial*
- Quarterly Journal of Pharmacy. 1 +. 1928 +. Contains abstracts.
- PHARMACOLOGY**
- BACHEM, CARL. Sammelreferat aus dem Gebiet der Pharmakologie. *Zentr. innere Med.* 45: 99-102, 455-458, 781-784, 1048-1051 (1924). 659 references. 46: 159-162, 499-502, 826-830, 1208-1210 (1925). 665 references. 47: 243-248, 570-574, 956-960, 1211-1215 (1926). 806 references. 48: 331-336, 717-722, 1118-1123 (1927). 722 references. 49: 37-42, 395-400, 716-720, 998-1002 (1928). 846 references. 50: 278-283, 454-455, 714-716, 951-953, 1148-1150 (1929). 602 references. 51: 198-200, 522-524, 752-755, 1069-
- PHAGOCYTOSIS ***
- Phagocytosis, effect of chemical and physical agents on. *Index-Cat., S. G. O.*, 3rd ser., 8: 860-861 (1929).
- PHARMACEUTICALS**
- FOOTE, PERRY A. Tablets. I. The evolution of the tablet machine. II. A bibliography on tablets. *Bull. Univ. of Wisconsin*, Serial No. 1566. 1928. 164 p.
- HORKHEIMER, PHILIPP. Anleitung zu medizinisch-chemischen Untersuch-

PHARMACOLOGY—Cont'd

1071 (1930). 433 references. 52: 227-230, 605-608, 883-886 (1931). 383 references.

CLARK, ALFRED J. *Applied pharmacology*. 3rd ed. London, Churchill, 1929. 529 p. References at end of each chapter.

HANDOVSKY, HANS. *Pharmakologie in ihren modernen Problemstellung*. Dresden, Steinkopff, 1931. 224 p. Bibl., p. 188-215.

HOUBEN, J. *Fortschritte der Heilstoffchemie*. Zweite Abt. *Die Ergebnisse der wissenschaftlichen Literatur*. Bd. I. *Die aliphatischen und hydrierten isocyclischen Verbindungen*. Berlin, De Gruyter, 1930. 1500 p. Extensive bibl. footnotes.

McDOWELL, R. J. S. Use of common compounds of carbon in disease, with special reference to cholera. *Edinb. Med. J.* 37: 481-482 (1930). 51 references.

MENEGHETTI, E. Ueber die pharmakologische Wirkung des kolloidalen Eisensulfids. *Biochem. Z.* 121: 39 (1921). 28 references.

MOLITOR, HANS. *Pharmakologie*. In *Jahresber. Physiol. exptl. Pharmacol.* 9: 812-832 (1928). Bibl. footnotes.

MUNCH, JAMES C. *Bioassays. A handbook of quantitative pharmacology*. Baltimore, Williams and Wilkins, 1931. 958 p. *Bioassays*, p. 3-7; 88 references. *Experimental technic*, p. 26-28; 70 references. *Drugs affecting the nervous system*, p. 181-225; 1078 references. *Drugs affecting circulation*, p. 441-495; 1261 references. *Drugs affecting respiration*, p. 499; 18 references. *Drugs affecting the muscles*, p. 549-566; 416 references. *Bioassays of glandular products*, p. 679-736; 1176 references. *Bioassay of special types of drugs*, p. 848-906; 1226 references.

OPPENHEIMER, ERNST. *Die Ergebnisse pharmakologischer Forschung*. In *Jahresber. Physiol. exptl. Pharmacol.* 5: 706-778 (1924). Bibl. footnotes. *Pharmacology*. *Index-Cat.*, S. G. O., 3rd ser., 8: 863-866 (1929).

Pharmakologie und Toxikologie. In *Jahresber. Physiol. exptl. Pharmacol.* 1: 888-926; 2: 637-696; 3: 1254-1311; 4: 746-810; 5: 1599-1687; 6: 816-908; 7: 1705-1802; 8: 566-646; 9: 1429-1538; 10: 584-684 (1920-1929). Very complete bibl. for these years.

ROGERS, LEONARD. Recent advances in the treatment and prophylaxis of leprosy. *Edinburgh Med. J.* 37: 25-27 (1930). 88 references.

SABALITSCHKA, T., and TIETZ, H. *Synthetische Studien über die Beziehung zwischen chemischer Konstitution und antimikrobiischer Wirkung*. XI. *Zwei- und dreifach hydroxylierte oder oxalkylierte Benzoesäuren und deren Ester*. *Arch. Pharm.* 269: 545-566 (1931). 54 footnotes.

TIFFENEAU, M., LEVY, J., and BROWN, D. Influence des variations de la réserve alcaline et du pH sur quelques actions pharmacodynamiques centrales ou périphériques. *Arch. intern. pharmacodyn. therapie* 38: 504-506 (1930). 66 references.

ZUNZ, EDGARD. *Éléments de pharmacodynamie générale*. Paris, Masson, 1930. 488 p. Bibl. at end of chapters.

PHARMACY

GLASER, ERHARD. Das Wesen des bakteriophagen Prinzips als Grundlage der pharmakognostischen Beurteilung. *Pharm. Monatsh.* 11: 253-254 (1930). 223 references.

POLLAK, J. Makrochemische Untersuchungsmethoden der Pharmazie. In *Abderhalden, Handb. biol. Arbeitsm.* 4, pt. 7C: 193-1144 (1929). Bibl. footnotes.

Serial

Quarterly Journal of Pharmacy. 1+. 1928+. Contains abstracts.

PHASE RULE

SEIFERT, H. *Geologische Thermometer*. *Fortschritte Mineral., Kryst. Petr.* 14: 284-291 (1930). 165 references.

PHENOL

MELANOFF, I. S. Actual and proposed synthesis of phenol. *Plastics* 6: 23, 30-31, 86, 97-99 (1930). Patents.

PHENYLACETALDEHYDE *

Phenylazetaldehyd. In *Wagner, Die Aldehyde*, 1929: 565-588. 94 footnotes.

PHENYLALANINE *

MAHN, HERBERT. Phenylalanin. In *Abderhalden, Biochem. Handl.* 12: 602-618 (1930). Bibl. footnotes.

PHOSPHATASE

NEUBERG, CARL, and SIMON, ERNST. *Phosphatasen*. In *Oppenheimer, Fermente*, 3: 743-755 (1929). 32 references.

PHOSPHATES

FINOT, MICHEL. Le marché des phosphates. L'avenir de l'industrie phosphatière en Afrique du Nord. Paris, Les presses Univ. France, 1929. 258 p. Bibl., p. 257-258.

HENDRICKS, S. B., *et al.* Structural characteristics of apatite-like sub-

stances and composition of phosphate rock and bone. *Ind. Eng. Chem.* 23: 1418 (1931). 42 references.

JACOB, K. D. Phosphate rock. *Mineral Ind.* 37: 484-486 (1928). 55 references. 38: 497-501 (1929). 88 references. 39: 470-473 (1930). 75 references.

JACOB, K. D. Recent developments in the phosphate industry. *Ind. Eng. Chem.* 23: 18 (1931). 54 references.

JOHNSON, BERTRAND L. Phosphate rock. I. General information. U. S. Bur. Mines, Information Circ. 6256. 1930. 64 p. Bibl., p. 19-20, 22-24. 30 references on technology of the industry; 28 references on uses.

PHOSPHATIDES

MAGISTRIS, HUGO, and SCHÄFER, PAUL. Zur Biochemie und Physiologie organischer Phosphorverbindungen in Pflanze und Tier. *Biochem. Z.* 214: 401-481 (1929). Bibl. footnotes. *Beiträge Biol. Pflanzen* 18: 139-140, 159-160 (1930). 85 references.

See also LIPIDS.

PHOSPHORESCENCE

LENARD, P., SCHMIDT, F., and TOMASCHKE, R. Phosphoreszenz und Fluoreszenz. Leipzig, Akad. Verlagsges., 1928. 1544 p. Several hundred footnotes.

TOMASCHKE, RUDOLF. Darstellung und Untersuchung phosphoreszierenden Stoffe. In *Stähler, Handb. Arbeitsm. anorg. Chem.* 4: 327-391 (1926). Bibl. footnotes; bibl., p. 381-392.

PHOSPHORIC ACID: Analytical.

ROSS, WM. H., and MERZ, A. R. Phosphoric acid. In *Wiley's Principles and Practice of Agricultural Analysis* II: 41-212 (1931). Bibl. footnotes.

PHOSPHORUS

FEIGL, FRITZ. Der Phosphor. *Mikrochemie* 7: 116-141 (1929). 88 footnotes. 57 references, p. 140-141.

KAUSCH, O. Phosphor, Phosphorsäure und Phosphate. Berlin, Springer, 1929. 325 p. Bibl., p. 212-230; patents, p. 231-301.

Phosphorus and compounds. *Index-Cat.*, S. G. O., 3rd ser., 8: 893-896 (1929).

PHOSPHORUS: Metabolism.*

BLEYER, P., and FISCHLER, F. Studien über den Phosphorsäurestoffwechsel. *Tierrernährung* 1: 88-103 (1929). Bibl. footnotes.

See also BIOCHEMISTRY (Peters), PHOSPHATIDES.

PHOSPHOTUNGSTIC ACIDS

MELLOR, J. W. Phosphotungstic acids. In *his Inorg. Theor. Chem.* 11: 874 (1931).

PHOTOCHEMISTRY

ALLMAND, A. J. Photochemistry, 1914-1925. In *Annual reports on the progress of chemistry* 22: 333-373 (1925). Bibl. of 220 references, p. 369-373.

BOBENSTEIN, MAX. Chain reactions. *Chem. Reviews* 7: 222-223 (1930). 22 references.

COEHN, A., JUNG, G., and DAIMER, J. Photochemie und photographische Chemikalienkunde. Vienna, Springer, 1929. 296 p. Hundreds of footnotes.

EMSCHWILLER, GUY. La synthèse photochimique des glucides (hydrates de carbone). *Bull. soc. chim.* 49: 1167-1187 (1931). 47 footnotes.

GRIFFITH, R. O., and McKEOWN, A. Photoprocesses in gaseous and liquid systems. London, Longmans, 1929. 691 p. Bibl. through text and as footnotes. Author index.

NOYES, W. ALBERT, and VAUGHN, WM. E. Thermal, electronic and photochemical decomposition of solid bodies. *Chem. Reviews* 7: 256-258 (1930). 55 references.

Photochemistry. In *Tables Annuelles* 6: 1041-1055 (1928); 7: 1321-1334 (1930). References through text.

SHEPPARD, S. E., and VANSELOW, W. The lattice energies of the silver halides and their photochemical decomposition. *J. Phys. Chem.* 34: 2748 (1930). 48 references.

SPONER, H. Der photochemische Primärprozess. *Z. angew. Chem.* 43: 823-830 (1930). 50 footnotes.

STOBBE, H., and BREMER, K. Zur Photochemie der Zimtsäuren, der Chalkone und ihrer Derivate. *J. prakt. Chem.* (N. S.) 123: 1-60 (1929). 119 references.

STYLE, D. W. G. Photochemistry. London, Methuen, 1930. 96 p. Bibl., p. 93-94.

TAYLOR, H. S. Photochemistry. In *his Treatise on Physical Chemistry*, 2nd ed., II: 1459-1518 (1931). Bibl. footnotes.

TAYLOR, HUGH S. Second report of the Committee on Photochemistry. *J. Phys. Chem.* 34: 2049-2091 (1930). National Research Council, Reprint and Circular Series, No. 96. 1930. 45 p. Bibl. footnotes.

See also KINETICS.

PHOTOELECTRIC CELLS *

- BARNARD, GEORGE P. The selenium cell; its properties and applications. London, Constable, 1930. 331 p. 50 pages of bibl.
- CAMPBELL, NORMAN ROBERT, and RITCHIE, DOROTHY. Photoelectric cells; their properties, use and applications. London, Pitman, 1929. 209 p. Bibl. footnotes.
- ZWORYKIN, V. K., and WILSON, E. D. Photocells and their applications. New York, Wiley, 1930. 209 p. Bibl., p. 177. References at ends of chapters.

PHOTOGRAPHY

- ANDRESEN, M., *et al.* Erzeugung und Prüfung lichtempfindlicher Schichten; Lichtquellen. Vienna, Springer, 1930. 344 p. Bibl. footnotes.
- CARROLL, B. H. The preparation of photographic emulsions. J. Chem. Education 8: 2366-2367 (1931). 62 references.
- CLARK, WALTER. The year's progress in applied photography. Photographic J. 69: 470 (1929). 35 references.
- EGGERT, J. Photographie. In Ullmann, Enzyk. tech. Chem., 2. Aufl., 8: 392-444 (1931). Bibl. through text, also p. 443-444.
- EGGERT, J., and MEDIGER, H. Fortschritte der Photographie in den letzten 10 Jahren. Z. angew. Chem. 42: 653-659, 684-687, 700-703 (1929). 346 footnotes.
- FORMSTECHER, FELIX. Die Fortschritte der Sensitometrie im Jahre 1930. Phot. Korr. 67: 115-123 (1931). 53 footnotes.
- GERMANN, FRANK E. E., and SHEN, DZU-KUN. Studies in photography. I. The nature of sensitivity and the latent image. J. Phys. Chem. 33: 864-872 (1929). Bibl. footnotes, "comprising a complete bibliography on the sensitizing effect of silver iodide in silver bromide emulsions."
- GREBE, L., HÜBL, A., and WALL, E. J. Farbenphotographie. Vienna, Springer, 1929. 246 p. Bibl., p. 235-236.
- GROTE, G. Neues in den Farbenphotographie. Phot. Korr. 66: 177-181 (1930); 67: 99-103 (1931). Bibl. footnotes.
- HAMER, F. M. Chemical study of desensitizers. Proc. 7th Intern. Cong. Phot. 1928: 102-104. 87 references.
- JACOBSON, KURT. Theorie und Praxis der Hypersensibilisierung. Berlin, Union deutsche Verlagsges., 1930. 97 p. Bibl., p. 96-97.
- KELLNER, HUGO MARIA. Der Einfluss starker Erhitzung auf die Eigenschaften photographischer Trockenplatten. Z. wiss. Phot. 24: 78 (1926). 25 references.
- KIESER, HEINZ. Zur Photolyse des bindemittelfreien Silberbromids (Silberbestimmung). Z. wiss. Phot. 26: 1-45 (1928). 33 footnotes.
- KIESER, HEINZ. Zur Theorie des photographischen Prozesses. Z. wiss. Phot. 26: 322-340 (1928). Bibl. footnotes.
- LÜPPO-CRAMER, —. Fortgesetzte Untersuchungen über den Herscheleffekt. Z. wiss. Phot. 26: 258-259 (1928). 25 references.
- LÜPPO-CRAMER, —. Topographische Verhältnisse bei der Entwicklung. Z. wiss. Phot. 24: 12 (1926). 27 references.
- MUDROVČIĆ, MATE. Ueber Farbstoffsensibilisatoren und geeignete Farbstoffe für das Ausbleichverfahren. Z. wiss. Phot. 26: 171-192 (1928). 50 footnotes.
- MUTTER, EDWIN. Zur Photolyse des bindemittelfreien Silberbromids (Brombestimmung). Z. wiss. Phot. 26: 233-234 (1928). 22 references.
- NEBLETTE, C. B. Photography; its principles and practice. 2d ed. New York, Van Nostrand, 1930. 615 p. Books, p. 559-560; magazine articles, p. 561-601.
- NEBLETTE, C. B. Review of progress in photography. Am. Ann. Phot. 45: 209-218 (1931). References through text.
- Photography. In Tables Annuelles 6: 1056-1091 (1928). References through text.
- RAWLING, S. O. Recent advances in our knowledge of the latent photographic image. Photographic J. 69: 478 (1929). 57 references.
- SEDLACZEK, A. Selenium toning process. Brit. J. Phot. 75: 784-785; 76: 4-6, 29-31, 44-46 (1929); Phot. Ind. 26: 1190-1192, 1218-1220, 1247-1249 (1928).
- SHEPPARD, S. E. Optical sensitizing of silver halides by colloidal silver. J. Franklin Inst. 210: 606-607 (1930). 44 references.
- SNODGRASS, LLOYD I. The science and practice of photographic printing. 3rd ed. New York, Falk Publ. Co., 1931. 337 p. Bibl., p. 324-328.
- SOCIETY OF CHEMICAL INDUSTRY. Photographic materials and processes. In Reports on the progress of applied chemistry 14: 641-667 (1929); 219 footnotes. 15: 682-707 (1930); 213 footnotes.
- STENGER, E. Die Englische photographische Literatur von 1839 bis 1870. Phot. Ind. 29: 32-35, 56-57, 204-206, 252, 254 (1931).
- TRIVELLI, A. P. H. The solarized latent image of photographic emulsions. J. Franklin Inst. 209: 373-389 (1930). 100 footnotes.

TRIVELLI, A. P. H. Versuch zu einer Hypothese des latenten Bildes. *Z. wiss. Phot.* 25: 77-78 (1927); 26: 392 (1928). 70 references.

WALL, EDWARD J. Photographic emulsions; their preparation and coating on glass, celluloid and paper, experimentally and on the large scale. Boston, Am. Photographic Pub. Co., 1929. 256 p. Bibl. notes at end of most of the chapters.

WILDT, RUPERT. Untersuchungen über den photographischen Diffusionslichthof. *Z. wiss. Phot.* 25: 184 (1927). 40 references.

PHOTOMETRY

BRODHUN, EUGEN. Die Entwicklung der Photometrie in diesem Jahrhundert. Ergebnisse exakt. Naturwissenschaften 6: 276-278 (1927). 80 references.

HARRISON, GEORGE R. Instruments and methods used for measuring spectral light intensities by photography. *J. Optical Soc. Am.* 19: 312-316 (1929). 175 references.

KELLNER, HUGO MARIA. Photographische Photometrie mit intermittierender Belichtung vom Standpunkt eines neuen Schwärzungsgesetzes. *Z. wiss. Phot.* 24: 61-62 (1926). 39 references.

PHOTOSYNTHESIS

LUBIMENKO, M. V. La biologie de la photosynthèse. *Rev. gén. biol.* 40: 504-512 (1928). About 300 references.

PFELSTICKER, KARL. Eine Theorie zur Photosynthese. *Biochem. Z.* 199: 20 (1928). 25 references.

SCHMALFUSS, H. Ueber biochemische Zusammenhänge zwischen Formaldehyd, Zucker und Pflanzensäuren. *Z. angew. Chem.* 43: 503 (1930). 49 references.

PHOTOTROPY

CHALKLEY, LYMAN, JR. Phototropy. *Chem. Reviews* 6: 277-280 (1929). 133 references.

PHYSICAL CHEMISTRY

FISCHER, HANS. Die physikalische Chemie in der gerichtlichen Medizin und in der Toxikologie. Zürich, Rudolf, 1925. 256 + xxxix p. Bibl., p. i-xxxix. Bibl. footnotes.

PHYSIOLOGICAL CHEMISTRY. *See* BIOCHEMISTRY.

PHYTIN

NEUBERG, CARL, and KOBEL, MARIA. Zuckerphosphate und Phytin. *In* Oppenheimer, Fermente 3: 406-422 (1929). 38 footnotes.

PIGMENTS

BORESCH, KARL. Die wasserlöslichen Farbstoffe der Schizophyceen. *Bio-*

chem. Z. 119: 205-206 (1921). 40 references.

COHN, G. Pflanzliche Farbstoffe. *In* Ullmann, Enzyk. tech. Chem., 2nd ed., 5: 114-152 (1930). References through text.

HOGREVE, FRIEDRICH. Beiträge zur Kenntnis der Haarpigmente von Rindern, Ziegen und Schweinen, unter besonderer Berücksichtigung neuerer physikalischer Arbeitsmethoden. *Z. Tierzücht., Züchtungsbiol., Tierernähr.* 13: 277-279 (1928). 65 references.

KARRER, P. Ueber Carotinoidfarbstoffe. *Z. angew. Chem.* 42: 918-924 (1929). 60 footnotes.

LUBIMENKO, M. V. Les pigments des plantes et leur transformation dans les tissus vivants de la plante. *Rev. gén. bot.* 40: 372-381 (1928). About 325 references.

Pigmentation (and pigments). *Index-Cat., S. G. O., 3rd ser., 8: 933-935 (1929).*

RUPE, HANS. Nachweis und Darstellung der wichtigsten Pflanzenfarbstoffe. *In* Abderhalden, Handb. biol. Arbeitsm. 1, pt. 10: 635-816 (1923). Bibl. footnotes.

VERNE, JEAN. Couleurs et pigments des êtres vivants. Paris, Colin, 1930. 219 p. Bibl., p. 207-216.

WELLS, H. G. Pathological pigmentation. *In* his Chemical Pathology, 5th ed., 526-558 (1925). 262 footnotes. *See also* CAROTIN, PORPHYRINS, SKIN.

PILOCARPINE

BLOMBERG, A., and RÖNNELL, S. Die Wirkung des Pilocarpins auf den Kreislauf des Menschen. *Arch. intern. pharmacodyn. thérapie* 37: 379-381 (1930). 39 references.

PINEAL GLAND

ASCHNER, B. Physiologie der Zirbeldrüse. *In* Hirsch, Handb. inneren Sekretion 2: 382-384 (1929).

DOHRN, MAX. Die Zirbeldrüse. *In* Oppenheimer, Handb. Biochem., 2 Aufl., Ergänzungsband: 403-409 (1930). 45 footnotes.

PINEAPPLE *

KOPP, A. Les ananas, culture—utilisation. Paris, Lechevalier, 1929. 283 p. Bibl., p. 254-281.

PIPERONAL

Piperonal. *In* Wagner, Die Aldehyde, 1930: 980-1018. 120 footnotes.

PITCH

OBST, W. Pitch and its suitability for road building. *Teer u. Bitumen* 27: 425-427 (1929). Patents.

PITUITARY EXTRACT *

Pituitary extract. Index-Cat., S. G. O., 3rd ser., 8: 950-955, 963-964 (1929).

Pituitrin. Index-Cat., S. G. O., 3rd ser., 8: 971-972 (1929).

See also PHARMACEUTICALS (Munch).

PLACENTA

Placenta, chemistry of, extract of, ferments of, internal secretion of. Index-Cat., S. G. O., 3rd ser., 8: 976, 979-980 (1929).

PLANTS: Composition.*

BISHOP, W. B. S. Distribution of manganese in plants and its importance in plant metabolism. Australian J. Exptl. Biol. Med. Sci. 5: 141 (1928). 36 references.

BORESCH, K. Bestandteile und Zusammensetzung des Pflanzenkörpers. Die anorganische Bestandteile. In Honcamp, Handbuch der Pflanzenernährung und Düngerlehre 1: 272-284 (1931).

COOPER, H. P. Ash constituents of pasture grasses, their standard electrode potential and ecological significance. Plant Physiol. 5: 210-214 (1930). 70 references.

FRANZEN, HARTWIG, and HELWERT, FRITZ. Kritisches über das Vorkommen der Citronensäure in den Pflanzen. Biochem. Z. 135: 384-415 (1923). 72 references. Annotated.

FRANZEN, HARTWIG, and HELWERT, FRITZ. Kritisches über das Vorkommen der Weinsäure in den Pflanzen. Biochem. Z. 136: 292-294 (1923). 43 references.

FRANZEN, HARTWIG, and KEYSSNER, ERNST. Kritisches über das Vorkommen der Aepfelsäure in den Pflanzen. Biochem. Z. 135: 183-216 (1923). Bibl. through text. Many annotated references.

FRANZEN, HARTWIG, and OSTERTAG, RUDOLF. Kritisches über das Vorkommen der Bernsteinsäure in den Pflanzen. Biochem. Z. 136: 327-335 (1923). Annotated.

ITERSON, G. VAN, JR. De wording van den plantaardigen celwand. Chem. Weekblad 24: 166-187 (1927). 111 footnotes.

LINSTOW, OTTO von. Bodenanzeigende Pflanzen. 2. Aufl. Berlin, 1929. 246 p. Bibl., p. 190-211.

MILLER, L., and MITCHELL, H. S. Correlation of copper and manganese content of plants and mineral additions to the soils. J. Am. Dietetic Assoc. 7: 256-257 (1931). 28 references.

NETOLITZKY, FRITZ, and FREY, ALBERT. Die Kieselkörper; die Kalksalze als

Zellinhaltskörper. Calciumoxalat-monohydrat und trihydrat. Berlin, Borntraeger, 1929. 130 p. Bibl., p. 101-118.

ONSLow, MURIEL. Practical plant biochemistry. Cambridge, Univ. Press, 1929. 206 p. References at end of chapters.

ROSENTHALER, LEOPOLD. Chemical investigation of plants. London, Bell and Sons, Ltd., 1930. 197 p. Bibl., p. 184-189.

SCHAFFNER, A. Stickstoffhaltige organische Stoffe. In Honcamp, Handbuch der Pflanzenernährung und Düngerlehre 1: 178-180 (1931).

TRAUB, HAMILTON P. Regional and seasonal distribution of moisture, carbohydrates, nitrogen and ash in 2-3 year portions of apple twigs. Minn. Agr. Expt. Sta., Tech. Bull. No. 53. 1928. 67 p. Bibl., p. 63-67.

WEHMER, C. Die Pflanzenstoffe. 2. Aufl. Bd. I. Jena, Fischer, 1929. 640 p. Bibl. through text.

PLANTS: Metabolism.

ALBACH, WALTER. Mikrorespirometrische Untersuchungen über den Einfluss der Vitalfärbung und der Plasmolyse auf die Atmung von Pflanzenzellen. Protoplasma 7: 420-422 (1929). 60 references.

BJÖRKSTEIN, J. Zur Kenntnis der Synthese von Eiweißstoffen und ihrer Bausteine bei höheren Pflanzen. Biochem. Z. 225: 1-80 (1930). Bibl. footnotes.

BOAS, FRIEDRICH. Untersuchungen über die Mitwirkung der Lipide beim Stoffaustausch der pflanzlichen Zelle. Biochem. Z. 117: 213-214 (1921). 34 references.

BODNAR, J. Ueber die enzymatische Ueberführung der anorganischen Phosphorsäure in organischer Form. Biochem. Z. 165: 1-15 (1925). 60 footnotes.

BORESCH, K. Kreislauf der Stoffe in der Natur. In Honcamp, Handbuch der Pflanzenernährung und Düngerlehre 1: 283-328 (1931). Bibl. footnotes; bibl., p. 320-328.

GARNER, W. W., et al. Rôle of chlorine in nutrition and growth of the tobacco plant and its effect on the quality of the cured leaf. J. Agr. Research 40: 646-648 (1930). 35 references.

HONCAMP, F. Handbuch der Pflanzenernährung und Düngerlehre. I. Pflanzenernährung. Berlin, Springer, 1931. 945 p. Bibl. through text.

JANSEN, GEORGE, and BARTHOLOMEW, R. P. The influence of the potash

- concentration in the culture medium on the production of carbohydrates in plants. *J. Agr. Research* 40: 259-261 (1930). 33 references.
- KELLEY, VICTOR W. Effect of certain hydrocarbon oils on the transpiration rate of some deciduous tree fruits. *Univ. Ill., Agr. Expt. Sta., Bull.* no. 353. 1930. p. 581-600. *Bibl.*, p. 599-600.
- KLEIN, G., and PIRSCHLE, K. Acetaldehyd als Zwischenprodukt der Pflanzennatmung. *Biochem. Z.* 168: 340-360 (1926). 39 footnotes.
- KLEIN, G., and WERNER, O. Formaldehyd als Zwischenprodukt bei der Kohlensäureassimilation. *Biochem. Z.* 168: 361-386 (1926). 41 footnotes.
- KRUSEMAN, W. M. De invloed van temperatuur en narcose op het transport der assimilaten. Thesis, *Univ. Utrecht*, 1931. 129 p. *Bibl.*, p. 123-129. 117 references.
- KUNATH, ALFRED. Der Wasserverbrauch der Gerste und seine Beeinflussung durch verschiedene Ernährung. *Arch. Pflanzenbau* 6: 636-637 (1931). 42 references.
- LEVAN, WM. C. The effect of metals on the respiration of *Lupinus albus*. *Am. J. Botany* 17: 394-396 (1930). 37 references.
- MAKSIMOV, NIKOLAI A. The plant in relation to water; a study of the physiological basis of drought resistance. London, Allen and Unwin, 1929. 451 p. *Bibl.*, p. 403-434.
- NIGHTINGALE, G. T., SCHERMERHORN, L. G., and ROBBINS, W. R. Some effects of potassium deficiency on the histological structure and nitrogenous and carbohydrate constituents of plants. *N. J. Agr. Expt. Sta., Bull.* 499. 1930. 36 p. *Bibl.*, p. 34-36. 85 references.
- ROBINSON, MURIEL ELAINE. Protein metabolism of the green plant. *New Phytologist* 28: 117-149 (1929). 84 references.
- SABALITSCHKA, TH., and WEIDLING, H. Ueber die Ernährung von Pflanzen mit Aldehyden. VII. Erhöhung des Kohlehydratgehaltes von *Elodea canadensis* durch Acetaldehyd. *Biochem. Z.* 176: 210-224 (1926). 44 footnotes.
- SCHIECK, WERNER. Einfluss von Kalium auf Assimilation und Transpiration von Sommergerste. *Arch. Pflanzenbau* 6: 462-464 (1931). 67 references.
- SEYBOLD, A. Die pflanzliche Transpiration. *Ergebnisse Biol.* 5: 145-165 (1929); 6: 712-731 (1930).
- STOKLASSA, JULIUS. Die physiologische Bedeutung des Phosphors beim Aufbau neuer lebender Pflanzenmasse. *Phosphorsäure* 1931: 66-68. 50 references.
- THOMAS, W. Feeding power of plants. *Plant Physiol.* 5: 476-489 (1930). 214 references.
- ULLRICH, H. Physiologie des Stoffwechsels der Pflanzen. In *Honcamp, Handbuch der Pflanzenernährung und Düngenlehre* 1: 415-423 (1931).
- PLASMA**
- MISSBACH, GERTRUD. Versuch zur Prüfung der Plasmaviskosität. *Protoplasma* 3: 342-344 (1928). 43 references.
- PICKERING, JOHN W. The blood plasma in health and disease. New York, Macmillan, 1928. 247 p. *Bibl.*, p. 222-239.
- RUNNSTROM, JOHN. Ueber die Veränderung der Plasma-Kolloide bei den Entwicklungserregung des Seeigels. *Protoplasma* 4: 509-513 (1928); 5: 305-310 (1928-29).
- WALTER, HEINRICH. Plasmaquellung und Assimilation. *Protoplasma* 6: 155-156 (1929). 50 references.
- See also BLOOD.
- PLASMOLYSIS ***
- BECK, WM. A. Cane sugar and potassium nitrate as plasmolysing agents. *Protoplasma* 1: 71-72 (1927). 33 references.
- KACZMAREK, A. Untersuchungen über Plasmolyse und Deplasmolyse in Abhängigkeit von der Wasserstoffionenkonzentration. *Protoplasma* 6: 292-301 (1929).
- PLASTER OF PARIS**
- ROSSMAN, J. Manufacture of plaster of Paris. *Rock Products* 32, no. 10: 66-72 (1929). 36 patent abstracts.
- PLASTIC FLOW**
- SACHS, GEORG. Plastische Verformung. In *Wien und Harms, Handbuch Experimentalphysik* V: 1-134 (1930). *Bibl.* footnotes.
- PLASTICITY**
- PIETERS, H. A. J. Plasticiteit. *Chem. Weekblad* 26: 18-24 (1929). About 125 references.
- SACHS, G. Plasticity problems in metals. *Trans. Faraday Soc.* 24: 84-92 (1929). 24 footnotes.
- See also VISCOSITY.
- PLASTICS: Synthetic.**
- ALADIN, —. Technology of cellulose acetate. *Plastics* 7: 142-144, 171, 202-204, 277-279, 330-331, 458-461, 554-556, 604-606 (1931). 235 patents, with annotations.

PLASTICS: Synthetic—Cont'd

- ALADIN, —. World progress in synthetic plastics. *Plastics* 5: 199, 202, 212-213, 258-260, 326-328, 449-451, 507-509, 627-630, 686-689 (1929); 6: 14-21, 82-84, 147-149, 262-264, 269-270, 386-388, 393, 394, 443-448, 505-507, 577, 579, 581-582, 601 (1930). Classified; abstracts of 495 patents. Continuation and amplification of previous similar compilations by Aladin in *Kunststoffe*.
- BARRY, T. HEDLEY. Albertol synthetic resins. *Ind. Chemist* 4: 504 (1928). 37 references.
- BARRY, T. HEDLEY. Synthetic resins from polybasic acids and polyhydric alcohols. *Ind. Chemist* 4: 56 (1929). 30 references and patents.
- BRADLEY, THEODORE F. Methods for detection and identification of synthetic resins. *Ind. Eng. Chem., Anal. Ed.* 3: 309 (1931). 31 references.
- FISCHER, EMIL J. *Matières plastiques à base de sang*. *Rev. gén. mat. plastiques* 6: 67-79 (1930); *Kunststoffe* 17: 173-174, 225-228 (1927); *Künst-dinger u. Leim* 27: 149-152 (1930). Patent review.
- KAUSCH, OSKAR. *Handbuch der künstlichen plastischen Massen*. Munich, Lehman, 1931. Bibl., p. 268-270. Patents, p. 292-307. About 2300 patents.
- NOUVEL, OTTO. *Die Industrie des Phenol-Aldehyd-Harze*. Halle, Knapp, 1931. 128 p. Bibl. footnotes. Patents, p. 104-113.
- OTTO, SCHULL. *Bibliographie des travaux, progrès et nouveautés dans le domaine de la technologie des matières plastiques, d'après la théorie des colloïdes pendant les années 1923-1927*. *Rev. gén. mat. plastiques* 4: 579, 581, 583, 585, 587, 649, 651 (1928).
- POLLAK, F. *Kunstharz*. In Ullmann, *Enzyk. tech. Chem.*, 2d ed., 7: 1-15 (1931). Patents on phenolic resins, p. 3-4; bibl., p. 15. Many patent references through text.
- RIVISE, C. W. Cold molding of resinoids. *Plastics* 5: 72-73, 86-87, 91-92 (1929). 31 patents.
- RIVISE, C. W. Ornamental effects with the artificial plastics. *Plastics* 7: 13-15, 157-159, 217-219, 283-287, 343-345, 348 (1931). Abstracts of patents.
- RIVISE, C. W. Resinoids and the printing art. *Plastics* 6: 324-326, 339, 454, 456, 461-465, 593, 646, 651, 663, 665 (1930); 7: 53-54, 101 (1931). Patents through text.
- RIVISE, C. W. Sound records and the resinoids. *Plastics* 6: 137-139, 155-157, 213, 216, 277-279, 334-335, 344, 397-401, 455-456 (1930). 47 American and 20 foreign patents abstracted.
- ROSSMAN, J. The cellulose acetate plastics. *Plastics* 6: 21-22, 28-30, 74-75, 150, 158-160, 211-212, 216-217, 270-271 (1930). 117 patents.
- ROSSMAN, JOSEPH. Pyroxylin as an imitative material. *Plastics* 5: 69-71, 94, 132-134, 153, 200-203, 251-253, 320-322, 386-387, 398-401, 442, 459-461, 500-502, 516-519, 566-568, 571, 576, 579, 622 (1929). Patent review.
- SCHEIBER, JOHANNES, and SÄNDIG, KURT. *Artificial resins*. London, Pitman, 1931. 447 p. Numerous bibl. footnotes and patents.
- ULLRICH, A. Ueber Kondensationsprodukte aus Phthalsäure bzw. Phthalsäureanhydrid und mehrwertigen Alkoholen. *Metallbörse* 20: 2413-2414, 2563-2564, 2613, 2660-2661, 2708-2709 (1930). Patent review.

PLATINUM

- DUPARC, L. *Platin*. In Doelter, *Handb. Mineralchem.* 3, pt. 2: 979-1011 (1926). Bibl. footnotes.
- Ein Decennium der Tätigkeit des Platininstituts der Akademie der Wissenschaften der USSR. *Metallbörse* 18: 1041-1045 (1928). 41 footnotes.
- INTERNATIONAL NICKEL Co. Literature and patent references to platinum group metals. Compiled by J. S. Negro. No. 1+. March, 1930+. Monthly. Autographed from type-written copy.
- LEITMEIER, H. Die physikalischen und chemischen Eigenschaften des Platins. In Doelter, *Handb. Mineralchem.* 3, pt. 2: 1011-1135 (1926). Bibl. footnotes.
- MCDONALD, D. *Platinum. Chemistry and Industry* 50: 1031-1041 (1931). 31 footnotes.
- SCHNEIDERHÖHN, H. *Erzmikroskopische und spektrographische Untersuchung von platinführenden Nickel-magnetkiesgesteinen des Bushveld Igneous Complex (Transvaal)*. *Chemie der Erde* 4: 283-285 (1929). 45 references.
- WAGNER, PERCY A. The platinum deposits and mines of South Africa. Edinburgh, Oliver and Boyd, 1929. 326 p. Bibl., p. 306-310.

POISONS

- LANTOW, J. L. The poisoning of livestock by *Drymaria pachyphylla*. *New Mexico Agr. Expt. Sta., Bull.* 173. 1929. 13 p. Bibl. p. 10-13.
- MALONEY, A. H., FITCH, R. H., and TATUM, A. L. PicROTOXIN as an antidote in acute poisoning by the shorter acting barbiturates. *J. Pharmacol.* 41: 480-482 (1931). 52 references.
- Poisons. *Index-Cat.*, S. G. O., 3rd ser., 8: 1070-1072 (1929).

SCHWAB, ROBERT. Der Einfluss von Traubenzucker auf dem Verlauf von Giftwirkung. *Z. ges. exptl. Med.* 67: 536-538 (1929).

See also GASES: ASPHYXIATING, INDUSTRIAL POISONS.

POLARIMETRY *

BRUHAT, GEORGE. *Traité de polarimétrie*. Paris, *Revue d'optique théorique et instrumentale*, 1930. 447 p. 882 references.

POLLEN

BOUILLENNE, M., and BOUILLENNE, B. *Recherches expérimentales sur l'agent toxique du pollen d'ambrosia div. sp. (Compositaceae)*. *Bull. sci. acad. roy. Belg.* 16: 1066-1073 (1930). 138 references.

COCOA, A. F., et al. Asthma and hay fever in theory and practice. Springfield, Ill., Thomas, 1931. 851 p. *Bibl.*, p. 783-796. 628 references, in part on pollen.

POLONIUM

GUILLLOT, M. Sur les conditions de précipitation du polonium et sur quelques uns de ses dérivés complex. *J. chim. phys.* 28: 128-129 (1931). 39 references.

POLYHALITE *

WEBER, K. Geologisch-petrographische Untersuchung am Strassfurt-Egelner Sattel unter besonderer Berücksichtigung der Genese der Polyhalit- und Kieserit-Region. *Kali* 25: 122-123 (1931). 83 references.

POLYIODIDES *

JONES, GRINNELL. Existence and behavior of complex polyiodides. *J. Phys. Chem.* 34: 673-691 (1930). *Bibl.* footnotes.

POLYMERIZATION

CAROTHERS, WALLACE H. *Polymerization*. *Chem. Reviews* 8: 420-426 (1931). 248 references.

POLYPEPTIDES

ROSSNER, ERNST. Polypeptide. *In* Abderhalden, *Biochem. Handl.* 12: 807-993 (1930). Numerous *bibl.* footnotes.

PORCELAIN. See REFRACTORIES (Dunn), SILICA.

PORPHYRINS

KIRRMANN, ALBERT. La synthèse des porphyrines. *Bull. soc. chim.* (4) 47: 931-932 (1930).

Porphyrins. *Index-Cat.*, S. G. O., 3rd ser., 8: 1107 (1929).

See also BLOOD: PIGMENTS, PIGMENTS.

POTASH

BERLINER, J. F. T. Potash bibliography to 1928. *U. S. Bur. Mines, Bull.* 327. 1930. 578 p. 3967 entries. Chrono-

logical. Annotated. Author and subject index.

SHREVE, R. NORRIS. Greensand bibliography to 1930. With a chapter on zeolite water softening. Annotated. *U. S. Bur. Mines, Bull.* 328. 1930. 78 p.

POTASSIUM

Potassium and compounds. *Index-Cat.*, S. G. O., 3rd ser., 8: 1114-1116 (1929).

POTASSIUM: Analytical.

ROSS, B. B., and WHITTAKER, C. G. Potash. *In* Wiley's *Principles and Practice of Agricultural Analysis* II: 329-432 (1931). *Bibl.* footnotes.

POTASSIUM CHLORIDE *

DOELTER, C. Sylvin (Kaliumchlorid). *In his* *Handb. Mineralchem.* 4, pt. 2: 1142-1161 (1928). *Bibl.* footnotes.

POTASSIUM PHOSPHATE *

ASKENASY, PAUL, and NESSLER, FRIEDRICH. Zur Kenntnis der Herstellung und Verwendung von Kaliumphosphaten. *Z. anorg. allgem. Chem.* 199: 327-328 (1930). 87 references.

PRECIOUS STONES: Artificial *

DOERMER, L. Künstliche Edelsteine. *In* Ullmann, *Enzyk. tech. Chem.*, 2nd ed., 4: 136-137 (1929).

KRAUSS, F. Synthetische Edelsteine. Berlin, Stilke, 1929. 134 p. *Bibl.*, p. 116-128.

See also MINERALS: SYNTHETIC.

PRECIPITATION

HAFNER, E. A. Zur Energetik der Aussalzung. *Biochem. Z.* 188: 269 (1927). 43 references.

PRECIPITINS

Precipitins. *Index-Cat.*, S. G. O., 3rd ser., 8: 1126 (1929).

PREGNANCY *

Pregnancy, blood in. *Index-Cat.*, S. G. O., 3rd ser., 8: 1129-1130 (1929).

Pregnancy, metabolism in. *Index-Cat.*, S. G. O., 3rd ser., 8: 1154-1155 (1929).

STANDER, H. J. The toxemias of pregnancy. *Medicine* 8: 1-157 (1929). *Bibl.* of 15 p.

PROLINE

MAHN, HERBERT. Prolin. *In* Abderhalden, *Biochem. Handl.* 12: 739-749 (1930). *Bibl.* footnotes.

PROTAMINES. See HISTONES.

PROTEASES

GRASSMANN, W. Nachweis und Bestimmung der Proteasen. *In* Oppenheimer, *Fermente* 3: 948-990 (1929). 125 footnotes.

PROTEASES—Cont'd

GRASSMANN, W. Proteasen. In Oppenheimer, Handb. Biochem., 2. Aufl., Ergänzungsband: 175-212 (1930). 279 footnotes.

GRASSMANN, W. Trennung der Hefeproteasen. In Abderhalden, Handb. biol. Arbeitsm. 4, pt. 1: 799-826 (1930). Bibl. footnotes.

KLEINMANN, HANS, and STERN, KURT G. Untersuchungen über tierische Gewebsproteasen. Biochem. Z. 222: 83, 122 (1930). About 50 references. See also ENZYMES (Hesse).

PROTEINS

ARNP, O., and HAFNER, E. A. Ueber die Refraktion der Serumeiweisskörper und die Individualität von Albumin und Globulin. Biochem. Z. 167: 468-473 (1926). 137 references.

BANCROFT, WILDER D., and BARNETT, C. E. Phase rule studies on the proteins. J. Phys. Chem. 34: 449-498, 753-798, 1930-1946, 2433-2471 (1930). Bibl. footnotes.

BELITZER, W. A. Ueber den Einfluss neutraler Salze auf den Kolloidzustand der Eiweisskörper. Protoplasma 12: 301-303 (1931). 41 references.

BURK, N. F., and GREENBERG, D. M. The state of aggregation of certain proteins in urea-water solutions. J. Biol. Chem. 87: 236-238 (1930). 58 references.

COHN, EDWIN J. Die physikalische Chemie der Eiweisskörper. Ergebnisse Physiol. 33: 782-786 (1931). 309 references.

FELIX, KURT. Eiweiss. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I: 177-184 (1929). 593 references.

FREUND, E., and LUSTIG, B. Ueber den Chemismus der Eiweisskoagulation. Biochem. Z. 167: 355-373 (1926). 46 footnotes.

GERNGROSS, O. Eiweissstoffe, Eiweisskörper (Proteine). In Ullman, Enzyk. tech. Chem., 2. Aufl., 3: 334-371 (1929). Bibl., p. 371. Many references through text, including patents.

GRÄNACHER, CHARLES. Die neueren Untersuchungen zur Konstitutionsaufklärung der Proteine. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2: 634-875 (1929). Bibl. footnotes.

GRASSMANN, WOLFGANG. Substrate der proteolytischen Enzyme: Proteine und Abbauprodukte; Peptide. In Oppenheimer, Fermente 3: 316-355 (1929). 182 footnotes.

HERD, C. W. Effect of heat on flour proteins. Cereal Chem. 8: 22-23 (1931). 40 references.

KLARMANN, EMIL. Die Rolle der zyklischen Aminosäureanhydride in der neueren Strukturchemie der Proteine. Fortschritte Naturwiss. Forschung, N. F., No. 7. 1929. 93 p. Bibl. footnotes.

KLOBUSITZKY, D. V. Ueber die Frage der Einheit der Serumeiweissfraktionen. Kolloidchem. Beihefte 32: 400-402 (1931). 71 references.

LEWIS, W. C. M. The crystallization, denaturation and flocculation of proteins, with special reference to albumin and hemoglobin. Chem. Reviews 8: 163-165 (1931). 78 references.

MCCANCE, R. A. The chemistry of the degradation of protein nitrogen. Physiol. Rev. 10: 28-34 (1930). About 240 references.

NEDHAM, JOSEPH. Protein metabolism and organic evolution. Science Progress 23: 633-648 (1929). 65 references.

PFEIFFER, H. Elektrizität und Eiweiss, insbesondere des Zellplasmas. Dresden, Steinkopff, 1929. 149 p. Selected bibl. in Chapter I.

Proteins. Index-Cat., S. G. O., 3rd ser., 8: 1216-1223 (1929).

SANDSTROM, WM. M. Comparative study of the acid and alkali binding of native and deaminized proteins. J. Phys. Chem. 34: 1098-1101 (1930). 60 references.

SMYTHE, C. V., and SCHMIDT, CARL L. A. Mode of combination of iron with certain proteins, amino acids and related compounds. J. Biol. Chem. 88: 267-269 (1930). 67 references.

SÖRENSEN, S. P. L. Konstitution der löslichen Proteinstoffe als reversibel dissoziabile Komponentensysteme. Kolloid-Z. 53: 102-124, 170-199, 306-318 (1930). 122 footnotes.

SÖRENSEN, S. P. L. Constitution of soluble proteins. Compt. rend. trav. lab. Carlsberg 18, no. 5. 1930. 124 p. Bibl. footnotes.

STAKER, ERNEST V., and GORTNER, ROSS A. Physico-chemical studies on proteins. V. Comparative study of the peptization of the protein complex in various seeds and grains. J. Phys. Chem. 35: 1603-1605 (1931). 57 references.

STRAUSS, EDUARD. Proteinoides. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 8: 551-576 (1921). Bibl. footnotes.

THOMAS, KARL. Biological values and the behavior of food and tissue proteins. J. Nutrition 2: 434-435 (1930). 40 references.

- WALDSCHMIDT-LEITZ, ERNST. Proteine. In Meyer-Jacobson, Lehrbuch org. Chem. II, p. V: 1-130 (1929). Bibl. footnotes.
- WASTENEYS, HARDOLPH, and BORSOOK, HENRY. The enzymatic synthesis of protein. *Physiol. Rev.* 10: 144-145 (1930). 67 references.
- WEBER, HANS H. Die Bjerrumsche Zwitterionentheorie und die Hydratation der Eiweisskörper. *Biochem. Z.* 218: 1-35 (1930). Bibl. footnotes.
- WLADIMIROFF, G. E. Beiträge zur Embryochemie und Embryophysiologie. I. Einige physikalisch-chemische Veränderungen des Eiereiweisses sich entwickelnder Hühnereier. *Biochem. Z.* 177: 296-297 (1926). 33 footnotes. See also BENCE-JONES PROTEIN, BIOCHEMISTRY (Peters and Van Slyke), MILK.
- PROTEINS: Metabolism.**
- GOTTSCALK, ALFRED. Anomalien des Eiweissabbaues. In Oppenheimer, Handb. Biochem., 2nd ed., 8: 853-891 (1925). 268 footnotes.
- KIECH, V. C., and LUCK, J. M. Amino acid metabolism. I. Relative rates of amino acid disappearance and urea formation. *J. Biol. Chem.* 94: 449 (1931). 36 references.
- SHIMA, K. Die Resorption von Eiweissabkömmlingen in Verdauungstraktus. *Biochem. Z.* 237: 337-338 (1931). 60 references.
- SILBERSTEIN, F., et al. Untersuchung über den intermediären Eiweissstoffwechsel. *Biochem. Z.* 213: 338-339 (1929). 65 references.
- VÖLTZ, W., and KIRSCH, W. Der Eiweissstoffwechsel der landwirtschaftlichen Nutztiere. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere 3: 70-75 (1931). 218 references. See also QUININE.
- PROTEOLYSIS ***
- Proteolysis. Index-Cat., S. G. O., 3rd ser., 8: 1223 (1929).
- PROTEOSES ***
- Proteoses. Index-Cat., S. G. O., 3rd ser., 8: 1223-1224 (1929).
- PROTOPLASM**
- ALBACH, WALTER. Zellen-physiologische Untersuchungen über vitale Protoplasmafärbung. *Protoplasma* 5: 412-443 (1929). Bibl. footnotes.
- BERSA, E. Strahlenwirkung auf Protoplasma und Biokolloide. *Protoplasma* 1: 159-166 (1927).
- BIALASZEWICZ, K. Recherches sur la répartition des électrolytes dans le protoplasma des cellules ovulaires. *Protoplasma* 6: 43-50 (1929).
- GAIDUKOV, N. Das Protoplasma als dynamischen Begriff. *Protoplasma* 6: 193-196 (1929). 101 references.
- HEILBRUNN, LEWIS V. The colloid chemistry of protoplasm. Berlin, Bornträger, 1928. 356 p. Bibl., p. 298-340.
- HEILBRUNN, L. V. The viscosity of protoplasma. *Quart. Rev. Biol.* 2: 246-248 (1927). 60 references.
- ILJIN, W. S. Die Durchlässigkeit des Protoplasmas. *Protoplasma* 3: 601-602 (1928). 56 references.
- KIESEL, ALEX. Chemie des Protoplasmas. Berlin, Borntraeger, 1930. 302 p. Bibl., p. 261-296. 568 references.
- LEONTJEW, HANS. Ueber das spezifische Gewicht des Protoplasmas. *Biochem. Z.* 170: 328 (1926); *Protoplasma* 2: 64 (1927). 25 references.
- LEPESCHKIN, W. W. Protoplasma. *Protoplasma* 9: 296-297 (1930). 67 references.
- Protoplasm. Index-Cat., S. G. O., 3rd ser., 8: 1224-1226 (1929).
- REICHEL, H., and SPIRO, K. Protoplasmagifte. In Handbuch der normalen und pathologischen Physiologie 1: 550-579 (1927). Bibl. footnotes.
- SEIFRIZ, WM. Structure of protoplasm. *Biol. Rev. Cambridge Phil. Soc.* 4: 99-102 (1929). 133 references.
- SEIFRIZ, WILLIAM. The viscosity of protoplasm. *Nat. Research Council, Bull.* No. 69: 256-261 (1929). 142 references.
- STEWART, F. C. Phosphatides in the limiting protoplasmic surface. *Protoplasma* 7: 618-621 (1929). 86 references.
- TIEGS, O. W. Surface tension and the theory of protoplasmic movement. *Protoplasma* 4: 135-139 (1928). 160 references.
- WEBER, FRIEDL. Viskosität und Elastizität des Protoplasmas. *Protoplasma* 1: 167-176 (1927).
- WEIXL-HOFMANN, HERTHA. Beiträge zur Kenntnis der Salzpermeabilität des Protoplasten. *Protoplasma* 11: 275-277 (1930). 75 references.
- ZACHARIAS, E. Die chemische Beschaffenheit von Protoplasma und Zellkern. *Progressus rei Botanicae* 3: 67-257 (1909). About 400 footnotes.
- PURINES**
- HORSTERS, HANS, and HORSTERS, HELENE. Neuere Synthesen biologisch wichtiger Pyridinkörper. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2: 2879-2970 (1930). Bibl. footnotes.

PURINES—Cont'd

LEVENE, P. A., and BASS, L. W. Purine bases. *In their Nucleic acids*, p. 95-125 (1931). 134 footnotes.

STARKENSTEIN, E. Die Beeinflussung des Purinhaushaltes durch Atophan, Calciumsalze und Radiumemanation. *Biochem. Z.* 106:168-171 (1920). 73 references.

PYRETHRUM

RIPERT, JEAN. Sur les méthodes d'examen chimique du pyrèthre. *Ann. fals.* 24: 340-341 (1931). 22 references.

PYRIDINE

MAIER-BODE, HANS. Pyridinchemie, 1924-1928. *Z. angew. Chem.* 44: 49-55 (1931). 86 footnotes.

PYRIMIDINES

LEVENE, P. A., and BASS, L. W. Pyrimidines. *In their Nucleic acids*, p. 35-74 (1931). 156 footnotes.

PYRITE*

TOKODY, L. Literatur über Pyrit. *Z. Krist.* 80: 322-348 (1931). 706 references.

PYRITES

RIDGWAY, ROBERT H. Pyrites. General information. U. S. Bur. Mines, Information Circ. 6523. 1931. 26 p. Bibl., p. 24-26.

PYRORACEMIC ACID

KLEIN, GUSTAV, and FUCHS, WALTER. Zum Brenztraubensäurenachweis bei der Hefegärung. *Biochem. Z.* 213: 40-64 (1929). 75 footnotes.

QUANTUM THEORY*

BLOCH, EUGÈNE. L'ancienne et la nouvelle théorie des quanta. Paris, Hermann, 1930. 417 p. Bibl., p. 409-412.

DUSHMAN, SAUL. Quantum theory and atomic structure. *In* Taylor, Treatise on Physical Chemistry, 2nd ed., II: 1103-1379 (1931). Bibl. footnotes.

HOUTERMANS, F. G. Neuere Arbeiten über Quantentheorie des Atomkerns. Ergebnisse exakt. Naturwissenschaften 9: 219-221 (1930). 108 references.

QUARTZ

TOLMAN, CARL. Quartz dikes. *Am. Mineralogist* 16: 278-299 (1931). Bibl., p. 297-299. 53 footnotes.

QUINIDINE. See QUININE.**QUININE**

JOHANNESHOHN, FRITZ. Chinin in der Allgemeinpraxis unter Berücksichtigung pharmakologischer Befunde. Amsterdam, Bureau tot Bevoeding van het Kinine-Gebruik, 1930. 232 p. Bibl. on quinine, p. 165-186. 652 references.

Bibl. on quinidine, p. 205-208. 157 references.

Quinidine. Index-Cat., S. G. O., 3rd ser., 9: 8 (1931). 21 references.

Quinine and salts. Index-Cat., S. G. O., 3rd ser., 9: 8-12 (1931).

SMORODINZEW, I. A. Der Einfluss des Chinins auf die Dynamik des Umsatzes der Kohlenhydrate und Fette. *Biochem. Z.* 197: 160-169 (1928). 77 footnotes.

SMORODINZEW, I. A. Der Einfluss des Chinins auf die Dynamik des Eiweissumsatz und der oxydo-reduzierenden Vorgänge. *Biochem. Z.* 201: 66-73 (1928). 67 footnotes.

TRIER, GEORG. Alkaloide der Chinarrinden. Chinin. *In his* Die Alkaloide, 2. Aufl., 399-437 (1931). Bibl. footnotes.

QUINONES

HOUBEN, J. Die Chinone. *In his* Meth. org. Chem., 3. Aufl., 3: 688-825 (1930). Bibl. footnotes.

RADIUM AND RADIOACTIVITY

CURIE, M., *et al.* The radioactive constants as of 1930. *Rev. Modern Physics* 3: 427-445 (1931); *J. Am. Chem. Soc.* 53: 2437-2450 (1931); *Physik. Z.* 32: 569-580 (1931). Bibl. through text.

DOERNER, H. A. Processes for extracting radium from carnotite. U. S. Bur. Mines, Reports of Investigations 3057. 1930. 35 p. Bibl., p. 33. Patents, p. 34-35.

FAJANS, KASIMIR. Radioelements and isotopes; chemical forces and optical properties of substances. New York, McGraw-Hill, 1931. 125 p. Bibl. footnotes.

FERREIRA DE ANDRADE, JOSÉ, JR. Radioatividade das aguas minerais de imperatriz e estudos sobre os niobotantalatos. Brazil, Serviço geologico e mineralogico, Bull. No. 48. 1930. 64 p. Bibl., p. 63-64.

HESS, FRANK L. Radium, uranium and vanadium. *Mineral Ind.* 37: 548-550 (1928).

HESS, FRANK L. Vanadium, uranium and radium in 1930. *Mineral Resources of the U. S.*, 1930, pt. I: 144-150. Annotated.

HOLMES, ARTHUR. Radioactivity and geological time. *Nat. Research Council, Bull. No.* 80: 156-158, 194-196, 223-228, 269-272, 316-320, 351-355, 388-392, 424-426, 456-459 (1930). 639 references.

KOVARIK, ALOIS F. Basis for computing the age of a radioactive mineral from the lead content. *Am. J. Sci.* 20: 100 (1930). 26 references.

KOVARIK, ALOIS F. Calculating the age of minerals from radioactivity data and principles. Nat. Research Council, Bull. No. 80: 118-123 (1930). 84 references.

LARKINS, A. JAMES. Radium in general practice. New York, Hoeber, 1929. 304 p. Bibl., p. 265-291.

LIND, S. C. Radioactivity. In Taylor, Treatise on Physical Chemistry, 2nd ed., II: 1723-1766 (1931). Bibl. footnotes.

Radioactive substances and radioactivity. Index-Cat., S. G. O., 3rd ser., 9: 30-33 (1931).

Radioactivity. In Tables Annuelles 6: 804-811 (1928); 7: 1086-1101 (1930). References through text.

Radium and radium emanation. Index-Cat., S. G. O., 3rd ser., 9: 38-44 (1931).

Radium und Isotopes. Gmelins Handbuch der anorganischen Chemie, 8. Aufl. System-Nummer 31. 1928. 80 p. Literature to Jan. 1, 1928.

RUSSELL, A. S. Radioactivity and subatomic phenomena. In Annual reports on the progress of chemistry 25: 303-322 (1928); 78 footnotes. 27: 305-325 (1930); 119 footnotes.

RUTHERFORD, ERNEST, CHADWICK, JAMES, and ELLIS, C. D. Radiations from radioactive substances. Cambridge, University Press, 1930. 588 p. Bibl. footnotes.

TYLER, PAUL M. Radium. U. S. Bur. Mines, Information Circ. 6312. 1930. 85 p. 80 footnotes.

TYLER, PAUL M. Radium, uranium and vanadium. Mineral Ind. 38: 569-570 (1929).

RAFFINOSE

ZEMPLÉN, GÉZA. Raffinose. In Abderhalden, Biochem. Handl. 13: 617-620 (1931). Bibl. footnotes.

RAMAN EFFECT *

ANDREWS, DONALD H. Raman spectra. Ind. Eng. Chem. 23: 1240 (1931). 52 references.

BHAGAVANTAM, S. The Raman effect. Its significance for physics and chemistry. Indian J. Physics 5: 237-307 (1930). Bibl., classified under 26 sections; author and subject index.

DADIEU, A., and KOHLRAUSCH, K. W. F. The Raman effect in organic substances and its use in chemical problems. J. Optical Soc. Am. 21: 321-322 (1931). 48 references.

GANESAN, A. S. Bibliography of 150 papers on the Raman effect. Indian J. Physics 4: 281-346 (1929).

KOHLRAUSCH, K. W. F. Bericht über den Smekal-Raman-Effekt. Physik. Z. 32: 405-406 (1931). 103 references.

LORENZ, —. Raman-Effekt. Landolt-Börnstein-Roth, Tabellen, 2nd suppl., 594-595 (1931).

SCHAEFER, CLEMENS, and MATOSI, FRANK. Der Ramaneffekt. Fortschritte Chem., Physik, physik. Chem. 20, No. 6. 1930. 52 p. Bibl. footnotes.

SMEKAL, ADOLF. Der Ramaneffekt und seine Bedeutung für die Spektroskopie des Molekülbaues. Z. Elektrochem. 36: 618-631 (1931). Bibl. footnotes.

RARE EARTHS

MEYER, R. J. Die Elemente der seltenen Erden. In Doelter, Handb. Mineralchem. 3, pt. 2: 548-560 (1926). Bibl. footnotes.

ROLLA, LUIGI. Le terre rare. Bologna, Zanichelli, 1929. 279 p. Bibl. footnotes.

See also GAS MANTLES.

RARE GASES

COHN, G. Edelgase. In Ullmann, Enzyk. tech. Chem., 2nd. ed., 4: 103-118 (1929). Patent references through text; bibl., p. 117-118.

See also GASES: INDUSTRIAL.

RATICIDES *

MUNCH, JAMES C., and SILVER, JAMES. The pharmacology of thallium and its use in rodent control. U. S. Dept. Agr., Tech. Bull. No. 238. 1931. 28 p. Bibl., p. 21-28. 148 references.

MUNCH, J. C., SILVER, JAMES, and HORN, E. E. Redsquill powders as raticides. U. S. Dept. Agr., Tech. Bull. No. 132. 1929. 36 p. Bibl., p. 35-36. 29 references.

RAYON

AVRAM, M. H. The rayon industry. New York, Van Nostrand, 1929. 893 p. Bibl., p. 857-875. Solvent recovery, p. 879.

BRANDENBERGER, H. Die Färberei der Acetatseide. Kunstseide 11: 98-106, 144-150, 183-186, 212-216, 265-268, 300-304, 338-345, 425-430, 459-462 (1929). 76 footnotes; patents through text.

BYRON, THOMAS H. Check list of patents for hollow artificial filaments. Ind. Eng. Chem., News Ed., 7, no. 16: 14 (1929).

DROESSEL, A. New investigations on viscose rayon. Tech. Chem. Papier-u. Zellstoff-Fabr. 25, no. 5: 69-78 (1929); Rayon 9, no. 11: 14, 16, 24, 40-42; no. 12: 14, 16, 39-41 (1929). Bibl., p. 41. 53 references.

RAYON—Cont'd

- DYES, W. A. Celanese, Rhodiaseta-, Aceta- und einige andere Acetatseiden-Erzeugungs- und Behandlungs-Patente. *Kunstseide* 10: 441-445, 484-490 (1928). Patents through text.
- DYES, W. A. Neuere englische Patentansprüche bezüglich Viscose-Kunstseide. *Kunststoffe* 19: 30-34, 59-62, 174-179 (1929). Patent review.
- DYES, W. A. Kupferseide. *Kunstseide* 11: 47-52, 90-98 (1929). Patents through text.
- FAUST, OTTO. Artificial silk. London, Pitman, 1929. 184 p. Bibl., p. 176-177.
- FAUST, O. Kunstseide. 4.-5. Aufl. Dresden, Steinkopff, 1931. 289 p. Bibl. footnotes. Bibl., p. 266-268.
- FOULDS, R. P. Finishing of artificial silk fabrics. *Ind. Chemist* 3: 291-293 (1927). Patent review.
- GABILLION, ROBERT. Soies artificielles et matières plastiques. Paris, Colin, 1931. 204 p. Bibl., p. 199-201.
- HOTTENROTH, V. Kunstseide. In Ullmann, Enzyk. tech. Chem., 2nd ed., 7: 20-83 (1931). Patents, p. 71-77; bibl., p. 81-83. Both classified.
- KRÜGER, D. Ueber Acetatseide. *Papierfabr.* 28: 1-8 (1930); *Kunstseide* 12: 262-267 (1930). 53 footnotes.
- LEVINE, HERBERT. Films and fibers derived from cellulose. *Trans. Instn. Chem. Eng.* 8: 32-37 (1930). Classified.
- LILIENFELD, LEON. Ueber Lilienfeldseide. *Kunstseide* 12: 128-139 (1930). Patent review.
- MULLIN, C. E., and STRIBLING, R. M. The hollow rayons. *Textile Colorist* 51: 157-160, 231-240 (1929). Patents through text. Bibl., p. 240.
- ROOS, K. Lilienfeldseide, ein Fortschritt. *Kunstseide* 12: 86-92 (1930). Patent review.
- ROSSMAN, JOSEPH. The manufacture of rayon from viscose. *Rayon* 9, no. 6: 24-26 (1929). Patent review.
- SCHWARZKOPF, O. Die Nachbehandlung der Spinnkuchen. *Kunstseide* 13: 389 (1931). Patents.
- SMOLLA, E. Fortschritte in der Technologie der Kunstseide. *Z. angew. Chem.* 43: 462-471 (1930). 93 footnotes.
- STADLINGER, HERMANN. Das Kunstseiden-Taschenbuch. Berlin, Finanz-Verlag, 1929. 254 p. Bibl., p. 175-178.
- SUVERN, K. Die künstliche Seide; ihre Herstellung und Verwendung. 5. Aufl. Erster Ergänzungsband (1926 bis 1928). Berlin, Springer, 1931. 642 p. Abstracts of 1035 patents. Patent list, p. 617-641.

WELTZIEN, W. Kunstseidenfärberei. *Kolloid-Z.* 52: 110-116 (1930). 24 footnotes.

WHEELER, EDWARD. The manufacture of artificial silk (rayon) with special reference to the viscose process. 2nd ed. London, Chapman and Hall, 1931. 177 p. References at the end of each chapter.

See also SILK (Greiff).

REACTION VELOCITY

RICE, F. O., and UREY, H. C. Reaction velocity in homogeneous systems. In Taylor, *Treatise on Physical Chemistry*, 2nd ed., II: 949-1018 (1931). Bibl. footnotes.

TAYLOR, H. S. Reaction velocity in heterogeneous systems. In his *Treatise on Physical Chemistry*, 2nd ed., II: 1019-1102 (1931). Bibl. footnotes.

See also KINETICS.

RECTIFIERS: Contact. *See* CONTACT RECTIFIERS.

REDUCTION

KRAUS, CHARLES A. Non-aqueous reduction reactions. *Chem. Reviews* 8: 263-264 (1931). 47 references.

SOMLO, F. Ueber die elektrolytische Reduktion einiger aromatischer Carbonsäuren. *Z. Elektrochem.* 35: 769-780 (1929). 51 footnotes.

REFRACTIVE INDEX

CHENEVEAU, CHARLES. Refractivity of selected solids and liquids. *International Critical Tables* VII: 15-16 (1930). 72 references.

DIXON, ALFRED L., and WEST, CLARENCE J. Refractivity of pure organic liquids. *International Critical Tables* VII: 62 (1930). 164 references.

FOX, J. J., and TATE, F. G. H. Refractivity of all gases and vapors and of elementary substances in the isotropic solid and liquid states. *International Critical Tables* VII: 11 (1930). 84 references.

KORTÜM, G. Ueber die Bedeutung und Anwendung der Rotationsdispersion für chemische Fragen. *Z. angew. Chem.* 43: 341-348 (1930). 54 footnotes.

MERWIN, H. E. Refractivity of birefringent crystals. *International Critical Tables* VII: 32-33 (1930). 254 references.

MOUTON, H. Electric and magnetic birefringence. *International Critical Tables* VII: 113 (1930). 43 references.

PICKARD, ROBERT H., HOUSSA, A. H. J., and HUNTER, HAROLD. Refractivity of mixtures. *International Critical Tables* VII: 108 (1930). 155 references.

SZIVESSY, —. Brechungsexponenten einachsiger Krystalle gegen Luft. Landolt-Börnstein-Roth, Tabellen, 1st suppl., 498-499 (1927); 2nd suppl., 744-745 (1931).

SZIVESSY, —. Brechungsexponenten und Achsenwinkel zweiachsiger Krystalle gegen Luft. Landolt-Börnstein-Roth, Tabellen, 1st suppl., 520-522 (1927); 2nd suppl., 808-812 (1931).

REFRACTORIES

CARRIE, C. M., and PASCOE, C. F. Magnesia refractories for steel furnaces. Can. Mining Met. Bull. No. 186: 1268-1272 (1927). 103 references.

COHN, W. M. Apparative Anordnungen zur Prüfung feuerfester Materialien auf Widerstand gegen Schlackenangriff. Chem. Fabrik 2: 74-77, 88-89 (1929). 46 references.

DUNN, J. A. The aluminous refractory materials cyanite, sillimanite and corundum in northern India. Mem. Geol. Survey India 52: 256-274 (1929).

FRITZ-SCHMIDT, M., and GEHLHOFF, G. Wärmeleitfähigkeitsmessung an feuerfesten Baustoffen. Glastech. Ber. 8: 206-228 (1930). 39 footnotes.

KAUHAUSER, F., and FLEK, J. Properties of refractories, their testing and behavior in operation. Chem. Obzor 3: 18-20, 44-46, 85-86, 103-110, 145-151 (1928).

LITINSKY, L. Literatur über feuerfeste Materialien für Kokereien und Gaswerke. Feuerfest 5: 46-49 (1929). 146 references.

NORTON, F. H. Refractories. New York, McGraw-Hill, 1931. 594 p. Bibl. at end of chapters.

SCHULZ, E. H., et al. Fortschritte auf dem Gebiete der feuerfesten Baustoffe. Stahl u. Eisen 50: 79-84, 1677-1681 (1930). 80 footnotes.

SOCIETY OF CHEMICAL INDUSTRY. Refractories, ceramics and cements. In Reports on the progress of applied chemistry 14: 227-239 (1929); 73 footnotes. 15: 245-262 (1930); 85 footnotes.

STEFER, W. Fortschritte auf feuerfesten Gebieten in der Vereinigten Staaten von Nordamerika im Jahre 1927. Feuerfest 4: 117-124 (1928). 1928. 5: 69-75 (1929). Bibl. footnotes.

WATTS, A. S., and KING, R. M. Relative heat transfer through refractories. Ohio State Univ., Eng. Expt. Sta., Bull. 64. 1931. 32 p. Bibl., p. 28-32.

REFRIGERATION

DREWS, KURT. Kältetechnik. Halle, Knapp, 1930. 212 p. Books, p. 210.

8

KRAUSE, —. Kälteerzeugung und Kälteverwendung. In Ullmann, Enzyk. tech. Chem., 2nd ed., 6: 387-418 (1930).

SHANAHAN, EDWARD W. Refrigeration as applied to the transportation and storage of food products. London, Gee and Co., 1929. 96 p. Bibl., p. ix-x.

ZAROTSCHENZEFF, M. T. Between two oceans, a general scientific and technical survey of rapid chilling and freezing systems for fish and meat. London, Cold Storage and Produce Rev., 1930. 157 p. Bibl., p. 153-154.

See also FOODS: PRESERVATION (Stiles).

REFUSE DISPOSAL*

NAUMANN, K. Schriftum über Müllbeseitigung, Strassenreinigung und Tierkörperverwertung. Staedtereinigung 20: 110-119 (1928). 300 references.

See also GARBAGE.

RENNIN*

GRIMMER, W. Lab und Labpräparate. In Winkler, Handb. Milchwirtschaft 2, pt. 2: 156-158 (1931).

WAHLIN, JOEL G. A study of rennin action. I. Rennin production by *Bacillus prodigiosus*. II. Effect of rennin on sodium caseinate. J. Bact. 16: 372-373, 385-386 (1928).

RESINS

BARRY, T. HEDLEY. Coumarone resins. Ind. Chemist 3: 431-432, 436, 479-482 (1927). Patent review.

BURNETT, W. B. Rosin in synthetic resins. Pine Institute of America, Tech. Bull. No. 1. 1930. 96 p. Patents in which rosin is used with synthetic resins.

DIETERICH, EUGEN. Analyse der Harze, Balsame und Gumminharze, nebst ihrer Chemie und Pharmakognosie. 2. Aufl. Berlin, Springer, 1930. 456 p. Bibl. at end of chapters.

HIBBERT, HAROLD, and PHILLIPS, JOHN B. The nature of the resins in Jack pine (*Pinus banksiana*). Can. J. Research 4: 33-34 (1931). 46 references.

VÈZES, PIERRE M., and DUPONT, G. Résines et térébenthines; les industries dérivées. Paris, Baillière, 1924. 656 p. Bibl., p. 263-267.

See also GUMS, PAINTS, PLASTICS: SYNTHETIC.

RESINS: Synthetic.* See PLASTICS: SYNTHETIC.

RESPIRATION

BAYER, GUSTAV. Pharmakologie der Atmung. In Handbuch der normalen und pathologischen Physiologie 2: 455-472 (1925). Bibl. footnotes.

RESPIRATION—Cont'd

BERNHARDT, HERMANN. Ueber die Erregbarkeit des Atemzentrums beim Menschen und deren Chemismus. *Biochem. Z.* 136:100-101 (1923). 52 references.

DAUTREBANDE, LUCIEN. Les échanges respiratoires au niveau des poumons et des tissus: physiologie-physiopathologie. Paris, Presses Univ. France, 1930. 448 p. Bibl., p. 405-443.

GESELL, ROBERT. Regulation der Atmung und des Kreislaufs. *Ergebnisse Physiol.* 28:340-345 (1929). 184 references.

LILJESTRAND, G. Atmung. In *Jahresber. Physiol. exptl. Pharmakol.* 3: 252-277 (1922). Bibl. footnotes.

PAECHTNER, J. Der Gaswechsel. In *Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere* 3:433-435 (1931). 140 references.

REINWEIN, H., and SINGER, W. Der Einfluss des physikalisch-chemischen Milieus auf die Atmung überlebender Warmblüterorgane. *Biochem. Z.* 183: 327 (1927). 27 references.

Respiration, chemistry of. *Index-Cat., S. G. O., 3rd ser., 9: 150-151 (1931).*

Respiration, effect of chemical, organic and physical agents on. *Index-Cat., S. G. O., 3rd ser., 9: 153-154 (1931).*

Respiration, physiology of. *Index-Cat., S. G. O., 3rd ser., 9: 155-159 (1931).*

SCHOEN, RUDOLF. Atmung. *Jahresber. Physiol. exptl. Pharmakol.* 5: 266-295 (1924); 7: 397-428 (1926); 9: 361-385 (1928). Bibl. footnotes.

RETENE *

CHEUNG, LI MAN. Retene. *Bull. inst. pin., 1929: 159-164, 183-190, 215-220.* 36 references.

RHENIUM *

DRUCE, J. G. F. The chemistry of divmanganese element of atomic number 75. *Sci. Progress* 24: 484-485 (1930). 24 references.

TYLER, PAUL M. Rhenium (and masurium). *U. S. Bur. Mines, Information Circ.* 6475. 1931. 17 p. Mimeographed. Annotated bibl., p. 7-17.

RHEOLOGY.* See VISCOSITY.**RHODIUM**

SIRK, H. Rhodium. In *Doelter, Handb. Mineralchem.* 3, pt. 2:1165-1168 (1926). 47 footnotes.

RHUS *

Rhus, toxicology of. *Index-Cat., S. G. O., 3rd ser., 9: 210-211 (1931).*

RICIN

Ricin, ricinin and ricinus. *Index-Cat., S. G. O., 3rd ser., 9: 221-222 (1931).*

RICKETS

Rickets, metabolism in. *Index-Cat., S. G. O., 3rd ser., 9: 229 (1931).* 28 references.

ROCKS

TICKELL, FREDERICK G. The examination of fragmental rocks. *Stanford Univ., Stanford Univ. Press, 1931.* 127 p. Bibl., p. 118-122.

ROENTGEN RAYS *

BECKER-ROSE, H. Ergebnisse der Materialprüfung mit Röntgenstrahlen. *Chem. Fabrik* 2: 271 (1929). 42 references.

BERNAL, J. D. Ergebnisse der modernen Metallforschung. In *Ergebnisse tech. Röntgenkunde II: 237-239 (1931).* 68 references.

CARDOSO, GABRIEL M. Los modernos métodos roentgenográficos aplicados en la determinación de la estructura cristalina de la epsomita. Madrid, Museo nacional de ciencias naturales, Trabajos, ser. geologica No. 37. 133 p. Bibl., p. 131-133.

CLARK, G. L. X-ray metallography in 1929. *Metals and Alloys* 1: 14-17, 57-68, 98-111 (1929). Several hundred footnotes. Bibl. of x-ray results on binary alloys. p. 106-111.

DAVEY, W. P. X-rays in science and industry. *Radiology* 11: 114 (1928). 28 references.

FINK, W. L., and ARCHER, R. S. Radiography as a tool in the metal industry. *Proc. Am. Soc. Steel Treating* 16: 586-590 (1929). 115 references.

FRIAUF, JAMES B. Application of x-rays to the study of metals. *Rev. Sci. Instruments* 1: 395-396 (1930). About 70 references.

GLOCKER, R. Ueber die Gesetzmässigkeiten der physikalischen und chemischen Wirkung der Röntgenstrahlen. *Z. tech. Physik* 9: 201-207 (1928). 35 footnotes.

GOTTFRIED, C. Neuere Ergebnisse der Röntgenforschung auf anorganischen Gebiet. In *Ergebnisse tech. Röntgenkunde II: 194-199 (1931).*

HALLE, F. Roentgenographische Messung homologer normaler Polymethylenverbindungen in orientiert kristallisierter Schicht. *Kolloid-Z.* 64: 95-97 (1931). 97 references.

MAYER, F. K. Ergebnisse der Teilchengrößenbestimmung mit Hilfe der Röntgenstrahlen. *Kolloid-Z.* 57: 353-359 (1931). 50 footnotes.

- MARK, H. F. Die Verwendung der Röntgenstrahlen in Chemie und Technik. Leipzig, Barth, 1926. 528 p. Bibl., p. 492-518.
- NÄHRING, E. Die Dispersion der Röntgenstrahlen. *Physik. Z.* 31: 418 (1930). 75 references.
- NEUBURGER, M. C. Röntgenographie der Metalle und ihrer Legierungen. Sammlung chem. chem.-tech. Vorträge, N. F., No. 1. 1929. 278 p. Bibl., p. 266-273.
- PETRY, EUGEN. Zur Kenntnis der Bedingungen der biologischen Wirkung der Röntgenstrahlen. *Biochem. Z.* 119: 44 (1921). 30 references.
- POLANSKY, VICTOR S. Literature on the use of x-ray. Heat Treating Forging 16: 876-880, 1011-1014 (1930).
- Röntgen rays. Index-Cat., S. G. O., 3rd ser., 9: 259-271 (1931). Includes effects of x-rays.
- SCHIEBOLD, E. Die Verfahren zur Bestimmung des Feinbaus von Werkstoffen. In *Ergebnisse tech. Röntgenkunde* 1: 69-102 (1930). Bibl. footnotes.
- THIBAUD, JEAN. Les rayons (théorie et applications). Paris, Colin, 1930. 218 p. Bibl., p. 215-216.
- TRILLAT, J. T. Les applications des rayons X; physique, chimie, métallurgie. Paris, Les Presses Univ. France, 1930. 298 p. Extensive bibl. at end of each chapter.
- WESTGREN, A. F., and PHRAGMÉN, G. X-ray studies on alloys. *Trans. Faraday Soc.* 25: 379-385 (1929). 34 footnotes.
- X-rays. In *Tables Annuelles* 6: 812-822 (1928); 7: 1064-1085 (1930). References through text.
- ZUNZ, E., and LA BARRE, J. Effets des rayons X de différentes longueurs d'onde et des rayons du radium sur la coagulation du sang, la glycémie et la calceime. *Ann. physiol.* 3: 870-873 (1927). 44 references.
- See also CRYSTAL STRUCTURE, ELECTRONICS (Rudberg), LIGHT: CHEMICAL ACTION.
- ROTENONE***
- TAKAI, S., MIYAJIMA, S., and Ōno, M. The structure of rotenone. *Bull. Inst. Phys.-Chem. Research (Tokyo)* 10: 211-219 (1931); *Ber.* 64B: 1000-1007 (1931). 42 footnotes.
- RUBBER**
- BACHMANN, W., et al. Ueber aktive Füllstoffe. *Kolloid-Z.* 57: 80 (1931). 56 references.
- BARAZETTI, A. Le caoutchouc. *Rev. gén. mat. plastiques* 3: 173-175, 249-250, 389-391, 453-456, 518-521, 581-584, 709-713 (1927); 4: 45-49, 109-112, 173-175, 427-428, 489-494, 553-560, 617-619, 681-688 (1928); 5: 45-50, 107-112, 173-179, 293-301, 419-426, 547-553, 611-620 (1929). Bibl. footnotes.
- BARY, PAUL. La régénération des caoutchoucs. Paris, L'édition technique, 1930. 144 p. Bibl. at end of chapters.
- BARY, PAUL, and HAUSER, EMIL A. Structure of rubber. *Rev. gén. caoutchouc*, June, 1928: 3-11; *Rubber Age* (N. Y.) 23: 685-687 (1928); *Rubber Chem. Tech.* 1: 409 (1928). 50 references.
- BRAZIER, SIDNEY A. Rubber industry. *Ind. Chemist* 3: 13-16 (1927); 4: 13-15 (1928); 5: 8-11 (1929). Bibl. through text.
- COTTON, F. H. White pigments. *India Rubber J.* 81: 676, 712 (1931). 25 references.
- CRONSHAW, H. B. Rubber information: An industrial and commercial compendium. London, Hill, 1930. 237 p. Bibl. of books.
- FISHER, H. L. The chemistry of rubber. *Chem. Reviews* 7: 131-138 (1930). 246 references.
- FISHER, H. L. Rubber; newer theoretical and practical developments. *J. Chem. Education* 8: 27-29 (1931). 71 references.
- GRENQUIST, ERNST A. Dispersion of pigments in rubber. *Ind. Eng. Chem.* 21: 669 (1929); *Rubber Chem. Tech.* 2: 656-667 (1929). 29 references.
- GRENQUIST, ERNST A. Structural changes during the processing of rubber. *Ind. Eng. Chem.* 22: 765 (1930). 33 references.
- VAN HARPEN, N. H. The electrometric determination of the hydrogen ion concentration in the latex of *Hevea brasiliensis* and its application to technical problems. Medan, Varekamp, 1931. 459 p. Bibl., p. 414-421. 159 references.
- HAUSER, E. A. Kautschuk. In Ullman, *Enzyk. tech. Chem.*, 2nd ed., 6: 526-527 (1930). Books only.
- Investigations on rubber in 1928 and 1929. *Intern. Rev. Agr.* 20, pt. 1: 152-155 (1929). 32 references.
- KOHMAN, G. T. Absorption of oxygen by rubber. *J. Phys. Chem.* 33: 226-243 (1929); *Rubber Chem. Tech.* 2: 390-405 (1929). 42 footnotes.
- KRÖGER, M., and LE BLANC, M. Grundlagen und Grenzen der elastischen Eigenschaften des Kautschuks und der kautschukähnlichen Stoffe. In *Ergebnisse angew. physik. Chem.* 1: 349-351 (1931). 85 references.

RUBBER—Cont'd

- LAGERQUIST, J. The aging of rubber. Tek. Tid., Upl. C., 59: 34-40 (1929). 98 references.
- McPHERSON, A. T. Reclaimed rubber. U. S. Bur. Standards, Circ. No. 393. 1931. 22 p. Bibl., p. 20-22. 43 references.
- MEMMLER, KARL. Handbuch der Kautschukwissenschaft. Leipzig, Hirzel, 1930. 766 p. Bibl. footnotes.
- VAN ROSSEM, A. Kolloidchemie und Kautschukindustrie. Kolloid-Z. 48: 283-293 (1929). 87 footnotes.
- ROSSMAN, J. Age-resistant rubber. Survey of United States and foreign patents on chemical deterioration of rubber. India Rubber World 83, no. 5: 65-68 (1931).
- ROSSMAN, JOSEPH. Direct uses of waste rubber. India Rubber World 77, no. 6: 60-62 (1928). 56 patents.
- ROSSMAN, JOSEPH. Manufacture of tire treads. India Rubber World 81, no. 4: 61-62 (1930). Patent review.
- ROSSMAN, JOSEPH. Ornamented rubber. India Rubber World 80, no. 1: 61-64; no. 2: 65-67 (1929). 50 patents.
- ROSSMAN, JOSEPH. Rubber grinding wheels. Indian Rubber World 84, no. 3: 63-65 (1931). Patent review.
- ROSSMAN, JOSEPH. Uniting rubber to metal. India Rubber World 79, no. 5: 65-68; no. 6: 69-72 (1929). 62 patents.
- ROSSMAN, JOSEPH. Water dispersions of rubber. India Rubber World 82, no. 5: 56-58 (1930). Patent review.
- SAGAJLO, MARJO. Active fillers for rubber. Przemysl Chem. 13: 154-157 (1929).
- SOCIETY OF CHEMICAL INDUSTRY. Rubber. In Reports on the progress of applied chemistry 14: 400-424 (1929); 155 footnotes. 15: 445-486 (1930); 187 footnotes.
- STAUDINGER, H. Constitution of rubber. Kolloid Z. 54: 129-140 (1931); Rubber Chem. Tech. 4: 379-380 (1931). 58 references.
- STAUDINGER, H. Ueber die polymerhomologen Hydrokautschuke. Helv. Chim. Acta 13: 1324-1334 (1930). 52 footnotes.
- STAUDINGER, H., and BONDY, H. F. Cryoscopic measurements on rubber solutions. Ber. 63B: 2900-2905 (1930); Rubber Chem. Tech. 4: 204-205 (1931). 32 references.
- STAUDINGER, H., and JOSEPH, H. Isoprene nitron. Ber. 63B: 2888-2899 (1930); Rubber Chem. Tech. 4: 199-200 (1931). 55 references.

SUMMERS, F. The improvement of yield in *Hevea brasiliensis*. Singapore, Kelly and Walsh, 1930. 198 p. Bibls. at end of chapters.

U. S. Bureau of Standards. Guide to the literature of rubber. U. S. Bur. Standards, Letter Circ. 305. 1931. 15 p.

See also ZINC OXIDE.

Serial

- Kautschuk. 1 +. 1926 +. Contains patents, abstracts and book reviews. Research Association of British Rubber and Tyre Manufacturers. Information Bureau. Summary of current literature. 1 +. 1923 +. References are classified.
- Rubber Chemistry and Technology. 1 + 1928 +. Reproduces abstracts from Rubber Section of Chemical Abstracts.

RUBIDIUM

PRIBRAM, RICHARD. Rubidium. In Doelter, Handb. Mineralchem. 3, pt. 2: 106-111 (1926). 55 references.

RUTHENIUM

SIRK, H. Ruthenium. In Doelter, Handb. Mineralchem. 3, pt. 2: 1168-1170 (1926). 19 references.

SACCHARASE

- Saccharase. Index-Cat., S. G. O., 3rd ser., 9: 342 (1931). 32 references.
- SCHNEIDER, KARL. Saccharase. In Oppenheimer, Fermente 3: 765-854 (1929). 93 footnotes.

SACCHARIN

- HERZOG, WALTHER. Fortschritte auf dem Gebiete der Saccharinnebenprodukteverwertung im Jahre 1927. Metallbörse 18: 903, 1015-1016, 1126-1127, 1183-1184, 1238-1239 (1928). 101 footnotes.
- Saccharin. Index-Cat., S. G. O., 3rd ser., 9: 342-343 (1931). 32 references.
- See also SWEETENING AGENTS.

SACCHAROSE

- Saccharose. Index-Cat., S. G. O., 3rd ser., 9: 343 (1931). 37 references.
- ZEMPLÉN, GÉZA. Saccharose. In Abderhalden, Biochem. Handl. 13: 528-548 (1931). Numerous bibl. footnotes.

SAGGERS*

EMERY, W. Refractories for the pottery industry. II. Saggars. Trans. Ceram. Soc. 27: 218-219 (1928). 60 references.

SALICYLIC ALDEHYDE

Salizylaldehyde. In Wagner, Die Aldehyde, 1930: 775-811. 180 footnotes.

SALIVA

Saliva, chemistry of. Index-Cat., S. G. O., 3rd ser., 9:358-359 (1931).

SCHULZ, N. Speicherdrüsen und Speichel. In Oppenheimer, Handb. Biochem., 2nd ed., 4:463-502 (1925). 249 references.

See also MUCIN.

SALMON

BOWER, WARD T. Salmon—an economical and valuable food. U. S. Bureau of Fisheries, Economic Circ. No. 69. 1929. 19 p. Bibl., p. 16-19.

PENTROGOV, B. P., MENTOV, YU. N., and KURNAEV. Physico-chemical characteristics of the breeding migration fast of (Amur River) Keta salmon. Bull. Pacific Sci. Fishery Research Sta., Vladivostok, 2, pt. 1:3-64 (1928). A bibl. is appended.

SALT

ANDERSEN, JOHS, and ØDUM, HILMAR. Om forekomsten af saltførende aflejringer i danmarks undergrund. Danmarks geologiske undersøgelse, II række, nr. 52. 1930. 111 p. Bibl., p. 108-111.

DAVIDOV, Y. K. Salt deposits and salt industry of Turkmenia. Gornuii Zhur. 105:1384-1401 (1929).

DELÉTANG, LUIS F. La "Salina del bebedero" y sus relaciones con el sistema hidrográfico "andino" o del "desaguadero." Argentine Republic, Dirección general de minas, geologica e hidrologia, Publ. No. 47. 1929. 69 p. Bibl., p. 58-63.

DIETZ, CURT. Die Salzlagerstätte des Werra-Kallegebietes. Archiv für Lagerstättenforschung, No. 40. 1928. 129 p. Bibl., p. 78-79.

DOELTER, C. Literaturübersicht zur Genesis der Salzlagerstätten. In his Handb. Mineralchem. 4, pt. 2:1292-1296 (1929).

DOELTER, C. Steinsalz. In his Handb. Mineralchem. 4, pt. 2:1026-1136 (1929). Bibl. footnotes.

FREYDANK, H. Das Salz und seine Gewinnung in der Kulturgeschichte. Kali 23:145-151, 161-168, 178-181 (1929). Several hundred footnotes.

IMPERIAL INSTITUTE. Mineral industry of the British Empire and foreign countries. Salt. London, The Institute, 1927. 123 p. Bibl., p. 113-123.

SALTING OUT EFFECT*

HAFNER, E. A. Zur Energetik der Aussalzung. Biochem. Z. 188:269 (1927). 43 references.

SALVARSAN. See ARSPHENAMINE, CHEMOTHERAPY.

SAND

THOENEN, J. R. Economics of new sand and gravel developments. U. S. Bur. Mines, Economic Paper 7. 1929. 60 p. Bibl., p. 52-60. 150 references.

WENTWORTH, CHESTER K. Sand and gravel resources of the coastal plain of Virginia. Va. Geol. Survey, Bull. 32. 1930. 146 p. Bibl., p. 31-33.

SANITATION

SOCIETY OF CHEMICAL INDUSTRY. Sanitation and water purification. In Reports on the progress of applied chemistry 14:573-609 (1929); 146 footnotes. 15:635-650 (1930); 59 footnotes.

STEADMAN, ROBERT F. Public health organization in the Chicago region. Chicago, Univ. Chicago Press, 1930. 279 p. Bibl., p. 270-273.

See also WATER PURIFICATION.

SAPONIFICATION*

BACHÉR, FRANZ. Die Verseifung. In Abderhalden, Handb. biol. Arbeitsm. 1, pt. 2:2585-2878 (1929). Bibl. footnotes.

SAPONINS

KOFLER, LUDWIG. Chemische, physikalische und biologische Eigenschaften der Saponine. Protoplasma 7:125-128 (1929). 120 references.

Saponins. Index-Cat., S. G. O., 3rd ser., 9:375 (1931). 46 references.

SCANDIUM. See GALLIUM.

SCOPOLAMINE

Scopolamine. Index-Cat., S. G. O., 3rd ser., 9:503-504 (1931).

SEA WATER

LEGENDRE, RENÉ. La concentration en ions hydrogène de l'eau de mer, le pH, méthode de mesure; importance océanographique, géologique, biologique. Paris, Les Presses Univ. France, 1925. 291 p. Contains bibls.

See also WATER: ANALYTICAL.

SECRETIN

Secretin. Index-Cat., S. G. O., 3rd ser., 9:520 (1931). 40 references.

STILL, EUGENE U. Secretin. Physiol. Rev. 11:352-357 (1931). 214 references.

SEDIMENTATION

STEIGER, GEORGE. Chemical studies which bear on sedimentation. National Research Council, Reprint and Circular Series, 85:20-23 (1928); 45 references. 92:76-82 (1930); 85 references. 98:76-79 (1931); 48 references.

SEEDS: Disinfection.

GRAM, ERNST. Afsvampningsundersøgelser. III. Korn og graesfrø. *Tidschr. for Planteavl.* 35: 141-268 (1929). 12 p. of bibl.

SELENIDES *

MELLOR, J. W. The selenides. *In his Inorg. Theor. Chem.* 10: 764-765, 802-808 (1930).

SELENIUM

BARNARD, GEORGE P. The selenium cell, its properties and applications. London, Constable & Co., 1930. 331 p. Contains references on selenium.

MELLOR, J. W. Selenium. *In his Inorg. Theor. Chem.* 10: 693-932 (1930). History and occurrence, p. 695-696; extraction and purification, p. 700; allotropic forms, p. 709-710; physical properties, p. 741-746; chemical properties, p. 755-757. The remainder of the chapter is devoted to compounds of Se.

SANTMYERS, R. M. Selenium and tellurium. U. S. Bureau of Mines, Information Circ. 6317: 21-23 (1930). Mimeographed.

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. R. Selenium. *In* Friend, Textbook Inorg. Chem. 7, pt. II: 286-349 (1931). Bibl. footnotes. Includes compounds.

SELENIUM: Organic Compounds.

BRADY, W. E. Organic compounds of selenium. *Proc. Indiana Acad. Sci.* 40: 159-163 (1931). 95 references.

BRADY, W. E., and VAN VALKENBURGH, M. Organic compounds of selenium. *Proc. Indiana Acad. Sci.* 39: 170, 179-181 (1929). 46 references.

STULL, A. A partial bibliography of the organic compounds of selenium and tellurium. New York, Am. Smelting and Refining Co., 1930. 16 p.

SELENIUM CELLS. See PHOTOELECTRIC CELLS.**SELENIUM HALIDES ***

MELLOR, J. W. Selenium halides. *In his Inorg. Theor. Chem.* 10: 902-903 (1930).

SELENIUM HYDRIDES *

MELLOR, J. W. Hydrogen selenides. *In his Inorg. Theor. Chem.* 10: 764-765 (1930).

SELENIUM OXIDES

MELLOR, J. W. Selenium dioxide. Hydrate of selenium dioxide—selenious acid. The selenites. *In his Inorg. Theor. Chem.* 10: 812-813, 819-820, 841-843 (1930).

MELLOR, J. W. Selenium trioxide and selenic acid. Selenates. *In his Inorg.*

Theor. Chem. 10: 852-853, 890-892 (1930).

SERINE

MAHN, HERBERT. Serin. *In* Abderhalden, Biochem. Handl. 12: 421-425 (1930). Bibl. footnotes.

SERUM

FABER, FRANS. Undersøgelser over serumkalken og serumfosforet i barnets første leveaar. Thesis, Copenhagen, 1928. 295 p. Bibl., 291-295.

Seruins. Index-Cat., S. G. O., 3rd ser., 9: 564-568 (1931).

SHEAR, M. J., and KRAMER, B. Composition of bone. IX. Equilibration of serum with dicalcium phosphate. *J. Biol. Chem.* 86: 693-694 (1930). 35 references.

SHINODA, TADASU. Ueber die serochemischen Veränderungen während Schwangerschaft, Geburt und Wochenbett. *Biochem. Z.* 152: 426-444 (1924). 50 footnotes.

STERN, RUDOLF. Ueber den Mechanismus der serologischen Luesreaktionen. *Biochem. Z.* 144: 136-137 (1924). 49 references.

WEIS-OSTBORN, W., and EHRENTHEIL, O. Zur Theorie der Meistagminreaktion beim Carcinom. *Biochem. Z.* 148: 324 (1924). 40 references.

SEWAGE

BUSWELL, ARTHUR M., *et al.* Bioprecipitation studies. III. State Water Survey, Bull. no. 25. 1928. 94 p. Bibl., p. 91-93.

BUSWELL, A. M., *et al.* Studies on two-stage sludge digestion. III. State Water Survey, Bull. 29. 1930. 92 p. Bibl., p. 92. 51 references.

BUSWELL, A. M., *et al.* The depth of sewage filters and the degree of purification. III. State Water Survey, Bull. 26. 1928. 100 p. Bibl. p. 78-80. 57 references.

BUSWELL, A. M., and NEAVE, S. L. Laboratory studies of sludge digestion. III. State Water Survey, Bull. 30. 1930. 84 p. Bibl., p. 79-84. 220 references.

ENSLow, L. H. Progress in sewage chlorination. *Contract Record and Eng. Rev.* 43: 1509 (1929). 37 references.

GASCOIGNE, GEORGE B. Chlorination of sewage and sewage effluents. *Proc. Am. Soc. Munic. Eng.* 36: 321-322 (1930). 38 references.

METCALF, LEONARD, and EDDY, HARRISON P. Sewerage and sewage disposal. 2nd ed. New York, McGraw-Hill, 1930. 783 p. Bibl. at end of some of the chapters.

- PETERS, B. G. Biological investigation of sewage, *J. Helminthology* 8: 162-164 (1930). 30 references.
- PETERSON, D. H. The reactions of a natural protozoan community to some organic acids. *Am. J. Hyg.* 8: 756-758 (1928). 38 references.
- ROLANTS, EDMOND. Les eaux usées. Paris, Baillière, 1925. 744 p. Bibl., p. 725-739.
- SEISER, ADOLF. Abwasserreinigung mit belebtem Schlamm. Ergebnisse Hygiene, Bakteriologie, Immunitätsforschung u. exptl. Therapie 9: 377-384 (1928).
- Sewage. Index-Cat., S. G. O., 3rd ser., 9: 570-575 (1931).
- See also WATER: ANALYTICAL.
- Serial*
- GT. BRITAIN. *Department of Scientific and Industrial Research*. Water pollution research. Summary of current literature. 1+. 1928+. Contains abstracts.
- SEX ORGANS**
- TRENDELENBURG, PAUL. Keimdrüsen. In *his* Die Hormone I: 1-97 (1929). Bibl. footnotes.
- See also HORMONES.
- SHOE POLISH ***
- EBEL, CARL. Die Fabrikation von Schuhcreme und Bohnerwachs. Halle, Knapp, 1930. 168 p. Bibl., p. 156-157.
- SILICA**
- PETAR, ALICE V. Sillimanite, kyanite, andalusite and dumortierite. U. S. Bureau of Mines, Information Circ. 6255. 1930. 19 p. Bibl., p. 17-19. 30 references.
- SILICA GEL**
- DE WAAL, A. J. C. Silica-gel. *Chem. Weekblad* 24: 274-284 (1927). 162 footnotes.
- WOLF, KUNO. Kieselsäuregel und Silicagel. *Metallbörse* 18: 453-455, 789-790 (1928). Patents through text.
- WOLF, KUNO, and PRAETORIUS, MAX. Kieselsäuregel und Silicagel. *Metallbörse* 18: 1293-1294, 2245-2246 (1928); 19: 341-342 (1929); 20: 2301-2302, 2357-2358 (1930). Patents through text.
- See also CATALYSTS (Druckner), COLLOIDS (Reitschotter).
- SILICATES**
- EITEL, WILHELM. Physikalische Chemie der Silikate. Leipzig, Voss, 1929. 552 p. Bibl. footnotes.
- FESSLER, A. H. New form of non-plastic material. *J. Am. Ceram. Soc.* 13: 329-331 (1930). 50 references to papers on Al silicates in *J. Am. Ceram. Soc.*
- GRUNER, JOHN W. Structure of some silicates. *Am. Mineral.* 16: 454 (1931). 38 references.
- See also CRYSTAL STRUCTURE (Bragg).
- SILICON ESTERS ***
- KING, G. Silicon esters and their application to the paint industry. *J. Oil Colour Chem. Assoc.* 13: 50 (1930). 25 references.
- SILK**
- GREIFF, WALTER RUDOLF DE. Ein Beitrag zur Seidenbaufrage mit Untersuchungen von Seide und Kunstseide. Berlin, Springer, 1929. 107 p. Bibl., p. 105-107.
- LEY, HERMANN, and RAEMISCH, ERICH. Technologie und Wirtschaft der Seide. Berlin, Springer, 1929. 551 p. Bibl. at end of each section.
- SCHOBER, JOSEPH. Silk and the silk industry. London, Constable, 1930. 375 p. Bibl., p. 335-354.
- SILK: Artificial.** See RAYON.
- SILVER**
- LEITMEIER, H. Silber. In Doelter, Hand. Mineralchem. 3, pt. 2: 112-168 (1926). Bibl. footnotes.
- Silver and compounds. Index-Cat., S. G. O., 3rd ser., 9: 627-629 (1931). Includes colloidal silver.
- SILVER CHLORIDE ***
- DOELTER, C. Silberchlorid (Kerargyrit). In *his* Handb. Mineralchem. 4, pt. 3: 58-69 (1930). Bibl. footnotes.
- SILVER IODIDE**
- DOELTER, C. Silberjodid. In *his* Handb. Mineralchem. 4, pt. 3: 77-95 (1930). Bibl. footnotes.
- SISAL ***
- SMITH, H. HAMEL. Sisal, production and preparation. London, Bale, 1929. 384 p. Bibl., p. 368-370.
- SIZING**
- PETERSON, E. C. Stiffness produced in fabrics by different starches and starch mixtures. U. S. Dept. Agr., Tech. Bull. 108. 1929. 30 p. Bibl., p. 27-29. Textile Colorist 51: 448-452, 531-534 (1929). 32 references.
- ROSSMAN, JOSEPH. Bakelite sizing by the beater method. Paper Trade J. 89, no. 2: 61-62 (1929). Patent review.
- ROSSMAN, JOSEPH. Paper sizing patent review. A review of the U. S. patents for sizing paper by the beater method. Paper Trade J. 89, no. 4: 54-60 (1929). 88 patents.
- ROSSMAN, JOSEPH. Wax sizing compositions. Paper Trade J. 89, no. 20: 59-61 (1929). 38 patents.
- See also PAPER and PULP.

SKIN

DEJUST, L. H. Pigment melanique et ferments de la peau humaine. *Bull. soc. chim. biol.* 9: 1229-1232 (1929). 69 references.

JENA, EDUARD. Ueber die chemische Schutzwirkung der Haut. *Ergebnisse Hygiene, Bakteriologie, Immunitätsforschung exptl. Therapie* 9: 611-618 (1928).

Skin, chemistry of. *Index-Cat., S. G. O.*, 3rd ser., 9: 650-651 (1931).

Skin, effects of chemical and physical agents on. *Index-Cat., S. G. O.*, 3rd ser., 9: 675-676 (1931).

Skin, pigment of. *Index-Cat., S. G. O.*, 3rd ser., 9: 687-688 (1931).

SLATE

BEHRE, CHARLES H. Slate in Northampton County, Pennsylvania. *Pa. Geol. Survey, Bull. M-9*, 1927. 308 p. *Bibl. footnotes.*

SLIME CONTROL *

BALDWIN, R. T. Bibliography on slime control with chlorine and compounds of chlorine. *Paper Trade J.* 92, no. 17: 54-55 (1931).

SOAP

DAVIDSOHN, J. Fortschrittsbericht aus dem Gebiete der Seifenindustrie in den Jahren 1923-1928. *Fortschrittsber. Chem.-Ztg.*, 1929: 109-130. 194 references.

DAVIDSOHN, J. Fortschritte aus der Seifenindustrie. *Chem. Umschau Fette, Oele, Wachse Harze* 35: 15-18, 166-169, 253-255 (1928); 36: 354-361 (1929); 37: 117-121 (1930). 67 references.

DAVIDSOHN, J. Seifenpulver. *Chem. Umschau Fette, Oele, Wachse Harze* 36: 354-361 (1929). References through text and as footnotes.

JARISCH, ADOLF. Ueber das Verhalten von Seifenlösungen bei verschiedener H-Ionenkonzentration. *Biochem. Z.* 134: 175-176 (1922). 31 references.

MULLIN, C. E., and RAMSEUR, A. R. Recent patents covering soaps, soap powders, etc. *Textile Colorist* 53: 373-378 (1931).

MULLIN, CHAS. E., and STRIBLING, ROSS M. Recent patents covering soaps, soap powders, soap-solvent mixtures, dry cleaning soaps and related products. *Textile Colorist* 51: 295-300 (1929); *Textile Recorder* 48, no. 568: 55-57; no. 569: 57-59; no. 570: 55 (1930).

RABBENO, ANGELO. L'azione farmacologica dei saponi. *Biochem. terap. sper.* 15: 146-149 (1928). 86 references.

Soap and soaps. *Index-Cat., S. G. O.*, 3rd ser., 9: 732-733 (1931).

SODIUM

FRIEDRICH, H., et al. Natriumverbindungen. In *Ullmann, Enzyk. tech. Chem.*, 2. Aufl., 8: 1-102 (1931). *Bibl. through text.*

Sodium and salts. *Index-Cat., S. G. O.*, 3rd ser., 9: 736-740 (1931).

SOIL

BEAR, FIRMAN E. Soil management. 2nd ed. New York, Wiley, 1931. 412 p. References at end of chapters.

BAVER, L. D. Relation of the amount and nature of exchangeable cations to the structure of a colloidal clay. *Soil Science* 29: 307-309 (1930). *Mo. Agr. Expt. Sta., Research Bull.* 129: 45-48 (1929). 45 references.

BLANCK, E. *Handbuch der Bodenlehre. VII. Der Boden in seiner chemischer und biologischen Beschaffenheit.* Berlin. Springer, 1931. 473 p. Numerous *bibl. footnotes.*

BONAVENTURE, G. Saggio bibliografico sulle ricerche eseguite in merito ai materiali disciolti nelle precipitazioni meteoriche. *Bull. ist. super. agrar Pisa* 6: 581-590 (1930).

EMERSON, PAUL. Principles of soil technology. New York, Macmillan, 1930. 402 p. *Bibl. footnotes.*

EIHRENBURG, P. Neue Fragen der Bodenstruktur. *Z. Pflanzenernährung, Düngung u. Bodenk.* 19: 44-77 (1931). 245 footnotes.

ENGELHARDT, J. H. Capillary phenomena in connection with the heterogeneity of the soil. *Soil Research* 1: 300-301 (1929). 49 references.

FEUSTEL, I. C., and BYERS, H. G. Physical and chemical characteristics of certain American peat profiles. *U. S. Dept. Agr., Tech. Bull.* No. 214. 1930. 26 p. *Bibl.*, p. 24-26. 40 references.

GAUS, W., and GRIESSBACH, R. Jodfrage und Landwirtschaft. *Z. Pflanzenernähr., Düngung u. Bodenk.* 13: 321-425 (1929). 200 footnotes.

GEHRING, ALFRED. Die chemischen und physikalischen Bodeneigenschaften in ihrer Bedeutung für das Pflanzenwachstum. In *Honcamp, Handbuch der Pflanzenernährung und Düngelchre* 1: 519-526 (1931).

GIESECKE, FRITZ. Die Hygroskopizität in ihrer Abhängigkeit von der chemischen Bodenbeschaffenheit. *Chemie der Erde* 3: 98-136 (1927). 84 footnotes.

HERZNER, A. Beiträge zur physikalischen Chemie unserer Kulturböden. *Z. Pflanzenernähr., Düngung u. Bo-*

- denk. 15: 342-361 (1929); 16: 315-331 (1930). 74 footnotes.
- HOFFMANN, ERICH. Studien über die Löslichkeit der Bodenphosphorsäure und -kieselsäure als Grundlage für die Phosphorsäurebedürfnisse. *Landw. Jahrb.* 72: 832-834 (1930).
- JOFFE, J. S., and McLEAN, H. C. Probable influence of anions on aluminum solubility in soils. *Proc. Papers First Intern. Congress Soil Sci.* 2: 254-255 (1928). 28 references.
- KEEN, BERNARD A. The physical properties of the soil. London, Longmans, 1931. 380 p. Bibl., p. 355-373. 263 references.
- LANDGRAF, K. E. Bodenreaktion und Wachstum des Wiesenpflanzen. *Z. Pflanzenernähr., Düngung u. Bodenk.* 13: 226-228 (1929). 36 references.
- MANN, H. B., Availability of manganese and of iron as affected by application of calcium and magnesium carbonates to the soil. *Soil Science* 30: 131-133 (1930). 53 references.
- MILLAR, CHARLES ERNEST. Soils and soil management. St. Paul, Webb Book Publ. Co., 1930. 477 p. References at end of each chapter.
- ORR, J. B. Minerals in pastures and their relation to animal nutrition. London, Lewis, 1929. 150 p. Bibl. at end of chapters.
- PIERRE, W. H. Hydrogen ion concentration, aluminum concentration in the soil solution and percentage base saturation as factors affecting plant growth on acid soils. *Soil Science* 31: 205-207 (1931). 47 references.
- RADU, IOAN F. Das Vorkommen der natürlichen Aziditätsformen in jungfräulichen Hauptbodentypen Gross-Rumäniens. Bucharest, 1930. 158 p. Bibl., p. 148-158. (Beilage zu "Buletinul agriculturii," Bd. 1-2, 1930).
- RATLEF, H. VON. Die Podsol- und Moorböden Russlands und der baltischen Staaten. *Z. Pflanzenernähr., Düngung u. Bodenk.* 17A: 223-226 (1930). 55 references. Includes chemical properties.
- REMEZOV, N. P. Ueber ungesättigte Böden. *Z. Pflanzenernähr., Düngung u. Bodenk.* 13: 241-242 (1929). 28 references.
- REYNOLDS, E. B. Chemical and microbiological study of Lufkin fine sandy loam in relation to productivity. *Texas Agr. Expt. Sta., Bull.* 42: 28-30 (1931).
- ROBINSON, W. O. Some chemical phases of submerged soil conditions. *Soil Science* 30: 216-217 (1930). 35 references.
- SAUERLANDT, WALTER. Untersuchungen über Bildung und Zersetzung von Humus im Stalldünger und im Boden. *Pflanzenbau* 2: 470-471 (1929). 86 references.
- SCHRERO, MORRIS. Bibliography of physical properties and bearing value of soils. *Proc. Am. Soc. Civil Eng.* 57: 871-921 (1931). 800 entries. Includes chemical and physical properties of soils. Previous bibls. appeared in *Proc. Am. Soc. Civil Eng.* 41: 497-513 (1915); 43: 1192-1240 (1917).
- SCHUCHT, FRIEDRICH. Grundzüge der Bodenkunde. Berlin, Parey, 1930. 405 p. Bibl., p. 377-391.
- SHOREY, EDMUND C. Some methods for detecting differences in soil organic matter. *U. S. Dept. Agr., Tech. Bull.* No. 211. 1930. 28 p. Bibl., p. 25-27.
- SOCIETY OF CHEMICAL INDUSTRY. Soils and fertilizers. In *Reports on the progress of applied chemistry* 14: 449-489 (1929); 151 footnotes. 15: 511-559 (1930); 185 footnotes.
- Soil. Index-Cat., S. G. O., 3rd ser., 9: 741-744 (1931).
- STEINRIEDE, FR. Die Mineralbestandteile des Bodens und die Methoden ihrer Erkennung. In *Blancck, Handb. Bodenlehre*, 7: 23-45 (1931). Bibl. footnotes.
- THOMAS, WALTER. Studies of certain phases of the interrelationship between soil and plant. I. Availability of mineral nutrients in relation to the degree of dispersion. *Soil Science* 27: 267-270 (1929). 98 references.
- TURNER, P. E. State of unsaturation of the soil in relation to its field behavior and lime requirements. *Soil Science* 30: 379-381 (1931). 37 references.
- WAKSMAN, SELMAN A. Chemische und mikrobiologische Vorgänge bei der Zersetzung pflanzlicher Rückstände im Boden. *Z. Pflanzenernähr., Düngung u. Bodenk.* 19: 29-31 (1931). 46 references.

Serial

Proceedings of the International Society of Soil Science. 1+. 1925+. Classified abstracts.

SOIL: Alkali.

DE SIGMOND, A. A. J., and ARANY, A. Bibliography relating to alkali (saline) soils. *Trans. Alkali-Subcommission, Intern. Soc. Soil Science*, Vol. A, Teil A: 41-80 (1929). 757 references.

SOIL: Analytical.

HASENBAUMER, J. Die chemische Bodenanalyse. In *Honcamp, Handbuch der Pflanzenernährung und Düngungslehre* 1: 805-806 (1931).

SOIL: Analytical—Cont'd

HIBBARD, P. L. Chemical methods for estimating the availability of soil phosphate. *Soil Science* 31:464-466 (1931). 31 references.

NIKLAS, H. Die biologischen Untersuchungsmethoden. *In* Honcamp, Handbuch der Pflanzenernährung und Düngerlehre 1:854-858 (1931).

RIESER, A. Die chemische Gesamtanalyse des Bodens. *In* Blanck, Handbuch der Bodenlehre 7:205-238 (1931). Bibl. footnotes.

ROBINSON, WM. O. Method and procedure of soil analysis used in the Division of Soil Chemistry and Physics. U. S. Dept. Agr., Circ. No. 139. 1930. 20 p. Bibl., p. 18-19.

SHOREY, E. C. Some methods for detecting differences in soil organic matter. U. S. Dept. Agr., Tech. Bull. No. 211. 1930. 27 p. Bibl., p. 25-27. 27 references.

WAKSMAN, S. A., and STEVENS, K. R. Critical study of the methods for determining the nature and abundance of soil organic matter. *Soil Science* 30:115-116 (1930). 24 references.

WHEETING, LAWRENCE C. Study of methods for the determination of the available potassium in soils. *Soil Science* 29:18-20 (1930). 31 references.

SOIL: Organic Compounds.

JENNY, H. Study on the influence of climate upon the nitrogen and organic matter content of the soil. *Mo. Agr. Expt. Sta., Research Bull.* 152:64-66 (1930).

MAIWALD, K. Organische Bestandteile des Bodens. *In* Blanck, Handbuch der Bodenlehre 7:113-204 (1931). Bibl. footnotes.

SALTER, FREDERICK J. Carbon-nitrogen ratio in relation to the accumulation of organic matter in soils. *Soil Science* 31:429-430 (1931). 38 references.

SOIL ACIDITY

GALLAGHER, PATRICK H. Soil acidity considered from the point of view of base exchange and hydrogen-ion concentration. *J. Dept. Agr. Ireland* 28:102-106 (1929). 72 references.

KERR, HENRY W. The nature of base exchange and soil acidity. *J. Am. Soc. Agronomy* 20:334-335 (1928).

LUNT, HERBERT A. Vertical distribution of soil bases and acidity in some Illinois soils. *Soil Science* 28:174-176 (1929). 32 references.

OLSEN, CARSTEN. Hydrogen ion concentration of the soil and its significance to the vegetation. *Compt. rend.*

trav. lab. Carlsberg 15, no. 1. 1923. 166 p. Bibl., p. 153-164.

SNYDER, E. F. Method for determining the hydrogen ion concentration of soils. U. S. Dept. Agr., Circ. 56:26-29 (1928). 68 references.

SOIL BACTERIA

CREUZBURG, ULRICH. Untersuchungen über den Einfluss des Pflanzenbestandes auf das Bakterienleben im Boden. *Landw. Jahrb.* 68:75-115 (1928). About 100 footnotes.

GAINNEY, P. L. The occurrence of azobacter in soil. *Proc. Papers First Intern. Congress Soil Sci.*, 3:116-117 (1928). 49 references.

KAYSER, EDMOND. Microbiologie appliquée à la fertilization du sol. 5th ed. Paris, Baillière, 1930. 364 p. Bibl., p. 355-357.

KAYSER, E. Travaux recents sur la microbiologie des sols. *Ann. agron.* 1:362-365 (1931).

NELSON, D. H. Isolation of some nitrifying organisms. *Iowa State Coll. J. Sci.* 3:159-161 (1929). 61 references.

REUSZER, HERBERT W. Microbiological changes occurring in a soil under pasture and bare conditions. *J. Am. Soc. Agronomy* 23:427-428 (1931). 28 references.

RIPPEL, A., *et al.* Die biologische Beschaffenheit des Bodens. *In* Blanck, Handbuch der Bodenlehre 7:239-437 (1931). Bibl. footnotes.

SCHNEIDER, EDUARD. Wie wirken Stickstoffkünstdünger auf Vorkommen und Entwicklung von *Azotobacter chroococcum* im Boden? *Arch. Pflanzenbau* 5:372-373 (1931). 53 references.

STAPH, C. Die Boden in biologischen Hinsicht. *In* Honcamp, Handbuch der Pflanzenernährung und Düngerlehre 1:592-601 (1931).

STARKEY, ROBERT L. Some influences of the development of higher plants upon the micro-organisms in the soil. I. Historical and introductory. *Soil Science* 27:331-334 (1929). 71 references.

STIGELL, RICH W. Experimental studies on the agricultural-chemical significance of certain bacteria. *Cent. Bakt. Parasitenk.* 23, II:764-765 (1909). 76 references.

SUBRAHMANYAN, V. Biochemistry of waterlogged soils. III. Decomposition of carbohydrates with special reference to formation of organic acids. *J. Agr. Sci.* 19:647-648 (1929). 30 references.

THOM, C. Present and future studies on soil fungi. *Proc. Papers First In-*

tern. Congress Soil Sci., 3: 46-47 (1928). 30 references.

WAKSMAN, SELMAN A. Der gegenwärtige Stand der Bodenmikrobiologie und ihre Anwendung auf Bodenfruchtbarkeit und Pflanzenwachstum. Fortschritte Naturwiss. Forschung, N. F., No. 10. 1930. 116 p. Bibl., p. 110-116.

WAKSMAN, SELMAN A., and STARKEY, ROBERT L. The soil and the microbe. New York, Wiley, 1931. 260 p. Bibl. at end of each chapter.

SOIL COLLOIDS

ANDERSON, M. S. The influence of substituted cations on the properties of soil colloids. J. Agr. Research 38: 583-584 (1929). 31 references.

ANDERSON, M. S., and MATTSON, SANTE. Properties of the colloidal soil material. U. S. Dept. Agr., Bull. 1452: 44-46 (1926). 57 references.

BRADFELD, RICHARD. Colloidal chemistry of the soil. In Alexander, Colloid Chemistry III: 589-590 (1931). 72 references.

EHRENBERG, P. Die Bodenkolloide. 3. Aufl. Dresden, Steinkopff, 1922. 717 p. Bibl. footnotes.

DI GLERIA, J., and ZUCKER, FR. Soil colloids. In Alexander, Colloid Chemistry III: 567-568 (1931). 79 references.

HAGER, D. Die Kolloidbestandteile des Bodens und die Methoden ihrer Erkennung. In Blanck, Handbuch der Bodenlehre 7: 45-112 (1931). Bibl. footnotes.

MARSHALL, C. E. Some recent researches on soil colloids. J. Agr. Sci. 17: 315-332 (1927). 50 references.

MATTSON, SANTE. Laws of soil colloidal behavior. Soil Science 28: 220, 408-409 (1929); 30: 494-495 (1930). 31: 330-331 (1931). 88 references.

SOIL FUNGI*

JENSEN, H. L. The fungus flora of the soil. Soil Science 31: 156-158 (1931). 69 references.

SOLDERS*

HIERS, G. O. Soft solders and their applications. Metals and Alloys 2: 261, 277 (1931). 47 references.

SOLUBILITY

HEYMANN, ERICH. Echte und kolloide Löslichkeit: Einfluss der Grenzflächen-tension. Kolloid-Z. 52: 269-280 (1930). 44 footnotes.

JERMOLENKO, N. Ueber kolloide Löslichkeit. Kolloid-Z. 49: 424-435 (1929). 35 footnotes.

Solubility. In Tables Annuelles 6: 846-960 (1928); 7: 1133-1240 (1930). References through text.

SOLUTIONS

FRAZER, J. C. W. The laws of dilute solutions. In Taylor, Treatise on Physical Chemistry, 2nd ed., I: 353-414 (1931). Bibl. footnotes.

JOHNSON, WARREN C., and MEYER, ALBERT W. Properties of solutions of metals in liquid ammonia. Chem. Reviews 8: 300-301 (1931). 54 references.

Solutions. Index-Cat., S. G. O., 3rd ser., 9: 748-751 (1931).

See also ACETIC ACID.

SOLVENTS

DURRANTS, T. H. Solvents. New York, Van Nostrand, 1930. 144 p. Bibls., including patents, at end of chapters.

SOPORIFICS.* See PHARMACEUTICALS (Munch).

SOY BEAN

FERREE, C. J., and TUSSAUD, J. T. The soya bean and the new soya flour. London, Heinemann, 1929. 79 p. Bibl., p. 78-79.

SEATTLE, Public Library. Bibliography on soy beans. Seattle, 1930. 36 p. Mimeographed.

SPECIFIC HEATS

Specific heats. In Tables Annuelles 7: 85-94 (1930). 51 references, p. 94. 8: 100-109 (1931). 42 references, p. 109.

See also GASES: SPECIFIC HEATS.

SPECTRA

Absorption spectra. In Tables Annuelles 7: 721-886 (1930). References through text.

CURTIS, W. E. Band spectra of helium. Trans. Faraday Soc. 25: 707 (1929). 43 references.

ELLIS, JOSEPH W. Molecular absorption spectra of liquids below 3μ . Trans. Faraday Soc. 25: 888-898 (1929). 45 footnotes.

Emission spectra. In Tables Annuelles 7: 414-720 (1930); 8: 544-1101 (1931). References through text.

FINKELBURG, W. Kontinuierliche Gasspektren. Physik. Z. 31: 21-25 (1930). 323 references.

FINKELBURG, W. Ueber das Molekülspektrum des Wasserstoffs. Z. Physik 52: 114-118 (1928). 98 references.

HOLMES, WALTER C. The absorption spectra of dyes. International Critical Tables VII: 209-211 (1930). 677 references.

KAYSER, H., and KONEN, H. Handbuch der Spectroscopie. Band VII. Part 1, 1923. Part 2, 1930. 750 p. Covers elements from A to Ir and the literature up to 1927.

SPECTRA—Cont'd

KRONIG, RALPH DE LAER. Band spectra and molecular structure. Cambridge, Univ. Press, 1930. 163 p. Bibl., p. 153-161.

LECOMTE, JEAN. Le spectre infrarouge. Paris, Presse Univ., 1929. 468 p. Bibl. at end of each chapter.

LECOMTE, JEAN. The infra-red spectra of liquids. Trans. Faraday Soc. 25: 875-876 (1929). 25 references.

LINDH, AXEL H. Röntgenspektroskopie. Leipzig, Akad. Verlagsges., 1930. 436 p. Bibl. footnotes.

MECKE, R. Bandenspektren und ihre Bedeutung für die Chemie. Fortschritte Chem., Physik, physik. Chem. 20, No. 3. 1929. 87 p. Bibl. footnotes.

MULLIKEN, ROBERT S. Band spectra and chemistry. Chem. Reviews 6: 543-545 (1929). About 100 references.

RAWLINS, F. I. G., and TAYLOR, A. M. Infra-red analysis of molecular structure. Cambridge, Univ. Press, 1929. 176 p.

ROBERTSON, ROBERT. Infra-red spectra of gases. Trans. Faraday Soc. 25: 899-912 (1929). 49 footnotes.

RUEDY, RICHARD. Les spectres de bandes. J. phys. radium 10: 159-160 (1929).

SCHAEFER, CLEMENS, and MATOSI, FRANK. Das ultrarote Spektrum. Berlin, Springer, 1930. 400 p. Bibl. footnotes.

TAYLOR, H. AUSTIN. Infra-red radiation in chemical processes. In Taylor, Treatise on Physical Chemistry, 2nd ed., II: 1519-1566 (1931). Bibl. footnotes.

See also RAMAN SPECTRA.

SPECTROSCOPY

BARRATT, S. Spectroscopy. In Annual reports on the progress of chemistry 23: 296-320 (1926). 72 footnotes.

SPINAL FLUID *

SCHMITT, WILLY. Kolloidreaktionen der Rückenmarkflüssigkeit. Dresden, Steinkopff, 1931. 200 p. Contains a bibl.

SPINEL *

HOLGERSSON, SVEN NILS RICHARD. Röntgenographische Untersuchungen der Mineralien der Spinellgruppe und von synthetisch dargestellten Substanzen von Spinelltypus. Lunds Univ. Arsskrift, n. f., avd. 2, bd. 23, nr. 9. 112 p. Bibl. footnotes.

SPLLEEN

BINET, LÉON RENÉ. La rate, organe réservoir. Paris, Masson, 1930. 116 p. Bibl., p. 105-116.

FABISCH, WALTER. Milz und Milzkrankheiten (1926-1928). Folia Hematol. 41: 302-306 (1930).

V. SKRAMLIK, EMIL. Die Milz. Ergebnisse Biol. 2: 544-553 (1927).

SPUTUM

PLESCH, JOHANN. Chemie des Sputums. In Oppenheimer, Handb. Biochem., 2nd ed., 5: 419-436 (1925). 66 footnotes.

Sputum and examination. Index-Cat., S. G. O., 3rd ser., 9: 885-886 (1931).

STAINS AND STAINING *

CONN, H. J. Biological stains; a handbook on the nature and uses of the dyes employed in the biological laboratory. 2nd ed. Geneva, N. Y., 1929. 224 p. Bibl., p. 204-215.

CONN, H. J. Development of bacterial staining methods. Stain Tech. 5: 48 (1930). 22 references.

CONN, H. J. Staining of blood and parasitic protozoa. Stain Tech. 5: 133-134 (1930). 30 references.

CONN, H. J. The history of staining. Stain Tech. 3: 10-11, 121 (1928); 4: 46-48 (1929); 5: 10-12 (1930). Includes cochineal and logwood dyes.

GICKLHORN, JOSEF. Elektive Vitalfärbung: Probleme, Ziele, Ergebnisse, aktuelle Fragen und Bemerkung zu den Methoden. Ergebnisse Biol. 7: 676-685 (1931).

GICKLHORN, JOSEF. Entwicklung und gegenwärtiger Stand einiger Probleme und Ziele der Vitalfärbung. Ergebnisse Physiol. 31: 388-390 (1931).

HOLMES, W. C. Stain solubilities. Stain Tech. 2: 48-49 (1927).

KONO, TAKEO. Untersuchungen zur Frage der Vitalfärbung und deren Beeinflussung durch Gifte. Protoplasma 11: 153-156 (1930).

KORNHAUSER, S. I. Development of cytological staining. Stain Tech. 5: 124-125 (1930). 28 references.

LATTA, J. S., and SCHULZ, R. Z. Reactions of lymphatic nodes to various dyes injected intravitaly. Folia Hematol. 35: 140-142 (1927). 70 references.

V. MOLLENDORF, WILHELM. Farbenanalytische Untersuchung. In Oppenheimer, Handb. Biochem., 2nd ed., 2: 273-314 (1925). 184 footnotes.

PETOW, HELMUT, and WITTKOWER, ERICH. Studien über die Acidität der Zellen und Gewebe. Z. ges. expatl. Med. 64: 753-756 (1929).

PFEIFFER, H. Ueber die Aufgaben und Grenzen elektroanalytischer Färbungsversuche *intra vitam*. Protoplasma 8: 286-290 (1930).

Staining. Index-Cat., S. G. O., 3rd ser., 9: 889-892 (1931).

STARCH

EYNON, LEWIS, and LANE, J. HENRY. Starch, its chemistry, technology and uses. Cambridge, Heffer, 1928. 256 p. Bibl. footnotes.

MALLOCH, J. G. Studies on the resistance of wheat starch to diastatic action. Canadian J. Research 1: 144-147 (1929). 90 references.

PICET, AMÉ. L'Amidon et ses produits de dégradation. In *Rapports sur les hydrates de carbone*, p. 138. About 75 references. (Dixième conférence de l'union internationale de chimie, Paris, 1930).

SCHOEN, M. La constitution de l'amidon. Bull. soc. chim. biol. 12: 1033-1099 (1930). 120 footnotes.

Starch. Index-Cat., S. G. O., 3rd ser., 9: 899-900 (1931).

THAYSEN, A. C., and GALLOWAY, L. D. The microbiology of starch and sugars. London, Oxford Univ. Press, 1930. 336 p. Bibl. at end of chapters.

ZEMPLÉN, GÉZA. Starkearten. In *Abderhalden, Biochem. Handl.* 13: 56-88 (1931). Bibl. footnotes.

ZIESE, WALTER. Stärke, Dextrine, Glykogen. In *Oppenheimer, Fermente*, 3: 274-284 (1929). 47 references.

STARK EFFECT *

LADENBURG, R. Die Starkeffekte höherer Atome und ihre quantentheoretische Deutung. Physik. Z. 30: 382-383 (1929). 35 references.

STEEL. See IRON and STEEL.**STEREOCHEMISTRY**

WITTIG, GEORG. Stereochemie. Leipzig, Akad. Verlagsges., 1930. 387 p. Bibl. footnotes.

STOMACH

BICKEL, A. Magen und Magensaft. In *Oppenheimer, Handb. Biochem.*, 2nd ed., 4: 503-557 (1925). 135 footnotes.

BOENHEIM, FELIX. Ueber das Minuten-volumen des Magens und seine Beeinflussung durch Blutdruck, durch Vagusreizung, durch Histamin und durch Organextrakte. Z. ges. exptl. Med. 71: 106-107 (1930). 58 references.

STEINITZ, HERMANN. Die Chlorabscheidung des menschlichen Magens in ihren Beziehungen zu pathologischen Vorgängen. Arch. Verdauungskrank. 42: 103-104 (1928). 82 references.

Stomach, contents of, examination of. Index-Cat., S. G. O., 3rd ser., 9: 974-976 (1931).

Stomach, ferments of. Index-Cat., S. G. O., 3rd ser., 9: 993-994 (1931).

Stomach, juice of. Index-Cat., S. G. O., 3rd ser., 9: 1002-1004 (1931).

Stomach, secretion of. Index-Cat., S. G. O., 3rd ser., 9: 1010-1014 (1931).

STORAGE BATTERIES

VINAL, GEORGE W. Storage batteries. 2nd ed. New York, Wiley, 1930. 427 p. Contains bibliographies.

STRONTIUM

Strontium. Gmelins Handb. anorg. Chem., 8. Aufl., System-Nummer 29. Berlin, Verlag Chemie, 1931. 239 p. Contains references through text.

STROPHANTHIN *

Strophanthin. Index-Cat., S. G. O., 3rd ser., 9: 1076-1077 (1931).

STRYCHNINE

Strychnine. Index-Cat., S. G. O., 3rd ser., 9: 1079-1080 (1931).

SUBLIMATION

KURSCHNER, KARL. Ueber Sublimation "unsublimierbarer" Stoffe. Mikrochemie 3: 1-20 (1925). 42 footnotes.

SUCCINIC ACID. See PLANTS: COMPOSITION.**SUGARS**

BENIN, G. S. Drying of beets and treatment of the dry beets in the sugar factories. Nauk. Zapiski Tzukrovoi Prom. 11: 215-246 (1931).

FREUND, RUDOLF. Laboratory control of processes. Listy Cukrovar. 47: 721-726 (1929). "Complete bibl."

GUNDERMANN, E. Kolloidchemie in der Zuckerindustrie in den letzten 10 Jahren. Kolloid-Z. 55: 229-239 (1931). 146 footnotes.

DEN HAAN, J. J. W. Patenten over continu-werkende Suikercentrifuges. Arch. Suikerind. 37: 500-516 (1929).

KAGANOV, I. N. Sugar crystallography. Nauk. Zapiski Tzukrovai Prom. 11: 263-272 (1931).

KHAINOSVSKY, V. Het wezen der warme behandeling van ampas. Arch. Suikerind. 35: 833-834 (1927). 56 references.

KING, R. H. Cane juice liming and clarification. Ind. Eng. Chem. 23: 965 (1931). 44 references.

KRYZ, FERDINAND. Chemische Kontrollmethoden und Verlustberechnung der Zuckerfabrikation. Leipzig, Jänecke, 1928. 233 p. Bibl., p. xi-xii.

LIPPMANN, EDMUND O. von. Geschichte des Zuckers seit den ältesten Zeiten bis zum Beginn der Rübenzucker-Fabrikation. 2. Aufl. Berlin, Springer, 1929. 824 p. Bibl. footnotes. Index of authors, p. 780-804.

SUGARS—Cont'd

NAKHMANOVICH, M. I., and BERMAN, S. L. Decolorizing sugar solutions for analysis. *Inst. Sugar Ind.*, Kiev, 1929. 184 p. 327 references.

RABINOWITCH, E. Die russisch-ukrainische Zuckerindustrie seit dem Weltkrieg (1914-1930). Berlin, Ost-Europa Verlag, 1930. 187 p. Bibl., p. 178-187.

SANDERS, K. Advances in physical chemistry of sugar technology. *Listy Cukrovar.* 48:153-160 (1929). 132 papers, covering 1927-1928.

SPENCER, GUILFORD L. A handbook for cane-sugar manufacturers and their chemists. 7th ed. New York, Wiley, 1929. 560 p. Bibl. footnotes.

VONDRAK, J. New inventions in sugar refining. *Listy Cukrovar.* 48:397-400 (1930); 49:220-222 (1931). Patent review.

WOHRYZEK, OSKAR. Chemie der Zuckerindustrie. 2. Aufl. Berlin, Springer, 1928. 680 p. Bibl. at end of chapters. See also WOOD: HYDROLYSIS.

SULFATES *

DITTRICH, M., *et al.* Die Sulfate. In Doelter, Handb. Mineralchem. 4, pt. 2: 1-671 (1929). Bibl. footnotes.

SULFITES *

MELLOR, J. W. Sulphites. In *his* Inorg. Theor. Chem. 10:271-273, 281-282, 284, 300-301, 302-303, 304, 306, 309, 319-320, 326-327 (1930).

SULFONATION *

HALBERKANN, JOSEF, and FRETWURST, FRITZ. Sulfonieren. In *Aberhalden*, Handb. biol. Arbeitsm., 1, pt. 1: 1969-2104 (1929). Bibl. footnotes.

SULFUR

BORGSTROM, B., BOST, R. W., and BROWN, D. F. Bibliography of organic sulfur compounds, 1871-1929. New York, American Petroleum Institute, 1930. 187 p. References classified according to chemical groups.

HEINZE, R. Entwicklung und Stand der Schwefelindustrie in Deutschland. Chem. Fabrik 1929:249-253, 288-290, 297-298, 306-309, 315-318, 345-347, 352-355, 362-363. 62 references.

MELLOR, J. W. Sulphur. In *his* Inorg. Theor. Chem. 10:1-692 (1930). History, p. 4; occurrence, p. 10-14; extraction, p. 21-23; allotropic forms, p. 28-29; amorphous and colloidal, p. 51-53; physical properties, p. 80-87; chemical properties, p. 106-110; valency and atomic weight, p. 113-114; references to chemical com-

pounds of sulfur scattered through the text.

RIDGWAY, ROBERT H. Sulphur. U. S. Bur. Mines, Information Circ. 6329. 1930. 55 p. Mimeographed. Bibl. p. 52-55.

Sulphur. Index-Cat., S. G. O., 3rd ser., 9:1102-1103 (1931).

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. R. Sulphur. In *Friend*, Textbook Inorg. Chem., 7, pt. II: 3-285 (1931). Bibl. footnotes. Includes compounds.

SULFUR: Metabolism.

MARSTON, HEDLEY R., and ROBERTSON, T. B. The utilization of sulfur by animals. Australia, Council Sci. Ind. Research, Bull. No. 39. 1928. 51 p. Bibl. through text.

MEYER-BISCH, ROBERT, and BASCH, E. Ueber das Schicksal parental verabreichten Schwefels und seinen Einfluss auf den Stoffwechsel. Biochem. Z. 118:49 (1921). 27. references.

See also BIOCHEMISTRY (Peters and Van Slyke).

SULFUR: Organic Compounds.

STEINKOPF, WILHELM. Organische Schwefelverbindungen. In *Houben*, Meth. org. Chem., 3d Aufl., 3:1230-1336 (1930). Bibl. footnotes.

SULFUR: Pharmacology.*

MONTAGNANI, MARIO. Contributo alla farmacologia dello solfo colloidali. I. Azione empoietica. II. Azione antianafilattica. Arch. intern. pharmacodyn. therapie 32:308-310 (1926); 33:111-113 (1927). About 200 references.

SULFUR DIOXIDE

MELLOR, J. W. Sulphur dioxide and sulphurous acid. In *his* Inorg. Theor. Chem. 10:244-254 (1930).

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. H. Sulphur dioxide and sulphurous acid. In *Friend*, Textbook Inorg. Chem. 7, pt. II:103-135 (1931). About 200 footnotes.

WAESER, BRUNO. Handbuch der Schwefelsäurefabrikation. Erster Band. Die Gewinnung des Schwefeldioxyds. Braunschweig, Vieweg, 1930. 848 p. Bibl. footnotes; references through text.

SULFUR HALIDES *

MELLOR, J. W. Sulphur chlorides, *etc.* In *his* Inorg. Theor. Chem. 10:647-649, 652, 655 (1930).

See also THIONYL HALIDES.

SULFUR HEPTOXIDE *

MELLOR, J. W. Sulphur heptoxide and persulphuric acid. In *his* Inorg. Theor. Chem. 10:473-475 (1930).

SULFUR TRIOXIDE

MELLOR, J. W. Sulphur trioxide. *In his Inorg. Theor. Chem.* 10:348-351 (1930).

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. H. Sulphur trioxide. *In Friend, Textbook Inorg. Chem.* 7, pt. II:135-148 (1931). About 100 footnotes.

SULFURIC ACID

AUDEN, H. A. Sulphuric acid and its manufacture. New York, Longmans, 1930. 231 p. Bibl. footnotes.

MELLOR, J. W. The hydrates of sulphur trioxide and sulphuric acid. *In his Inorg. Theor. Chem.* 10:360-361, 378-384, 425-432, 442-444 (1930).

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. H. Sulphuric acid. *In Friend, Textbook Inorg. Chem.* 7, pt. II:148-180 (1931). About 300 footnotes.

WAESER, B. Handbuch der Schwefelsäurefabrikation. 3 vols. Braunschweig, Vieweg, 1930. 2036 p. Several thousand footnotes. Books, I: xxv-xxviii. Patents, Chamber process, II: 894-896, 942-945; patent index, p. 2003-2034.

WAESER, BRUNO. Vanadinkontakverfahren. Brennstoff-Chem. 12:335-337 (1931). 24 references; patents through text.

See also CATALYSTS (Kausch).

SULFURYL HALIDES *

MELLOR, J. W. Sulphuryl halides. *In his Inorg. Theor. Chem.* 10:677-678 (1930).

SUPRARENALS

BAYER, G. Nebennieren. *In Hirsch, Handb. inneren Sekretion* 2:824-856 (1929).

JAFFÉ, R., and TANNENBERG, I. Nebennieren. *In Hirsch, Handb. inneren Sekretion* 1:643-661 (1926?).

REIS, MAX. Nebennieren. *In Oppenheimer, Handb. Biochem.*, 2. Aufl., Ergänzungsband.: 352-402 (1930). 393 footnotes.

Suprarenal extract. Index-Cat., S. G. O., 3rd ser., 9:1108-1116 (1931).

Suprarenal glands. Index-Cat., S. G. O., 3rd ser., 9:1116-1130 (1931). Includes chemistry and effect of chemical agents.

SURFACE TENSION

ADAM, NEIL K. The physics and chemistry of surfaces. Oxford, Clarendon Press, 1930. 332 p. Bibl. footnotes.

BARTELL, F. E. Wetting of solids by liquids. *In Alexander, Colloid Chem-*

istry III:59-60 (1931). 94 references.

DORSEY, N. E. Investigation of surface tension and associated phenomena. Nat. Research Council, Bull. No. 69:115-118 (1929). 84 references.

HERCIK, F. Surface tension in biology. *Protoplasma* 14:142-160 (1931).

HEYMANN, E. Neuere Untersuchungen über den Aufbau dünnster Oberflächenschichten (Filme) auf Flüssigkeiten. *Kolloid Z.* 57:81-101 (1931). 76 footnotes.

LORENZ, L. Oberflächenspannung und innere Reibung von Flüssigkeiten in ihrer Bedeutung für die Chemie. *Z. Elektrochem.* 36:343, 345-346 (1930). 72 references.

DU NOUY, P. LECOMTE. Étude des phénomènes de tension superficielle des solutions colloïdales biologiques. *Protoplasma* 6:515-516 (1929). 38 references.

Surface tension. Index-Cat., S. G. O., 3rd ser., 9:1131-1132 (1931).

Surface tension. *In Tables Annuelles* 7:60-79 (1930); 8:68-88 (1931). References through text.

See also PARACHOR.

SWEETENING AGENTS

HERZOG, W. Fortschritte auf dem Gebiete der synthetischen Süsstoffe und verwandten Verbindungen. *Fortschrittsber. Chem.-Ztg.* 1929:99-100. 27 references. 1931:93-94.

See also SACCHARIN.

TABLETS *

FOOTE, PERRY A. Tablets. I. The evolution of the tablet machine. II. A bibliography on tablets. Univ. of Wisconsin, Bull. No. 1566 (General series No. 1340). 1928. 164 p.

TAKADIASTASE *

COPPERSMITH, SOPHIE L. Further studies on the properties of *Aspergillus oryzae* or takadiastase. Thesis, Columbia Univ., 1929. 40 p. Bibl., p. 39-40.

OHLSSON, ERIK, and SWAETICHIN, TORO. Étude sur la takadiastase. *Bull. soc. chim. biol.* 11:384-386 (1929). 31 references.

TAMIYA, H. Studien über die Stoffwechselphysiologie von *Aspergillus oryzae*. *Acta Phytochim.* 3:51-173 (1927). 119 footnotes.

TANNASE *

FREUDENBERG, KARL. Tannase. *In Oppenheimer, Fermente* 3:733-738 (1929). 20 references.

TANNING AND TANNINS

BLOEMEN, A. Synthetische looistoffen. *Chem. Weekblad* 26:34-42 (1929);

TANNING AND TANNINS—*Cont'd*

- Gerber 55:162-164, *et seq.* (1929). 201 footnotes, containing references to about 300 patents.
- BRITTON, H. T. S. Importance of hydrogen ion concentrations in the preliminary stages of leather manufacture. *Ind. Chemist* 3:362-366 (1927). Bibl. through text.
- BRITTON, H. T. S. Importance of hydrogen ion concentrations of chrome tanning liquors. *Ind. Chemist* 3:452-456 (1927). Bibl. through text.
- CHAUVEL, HERVÉ. Les tannins végétaux, et en particulier, les écorces tannantes de Madagascar. *Lons-le-Saunier, Declume*, 1927. 178 p. Bibl., p. 165-171.
- DEKKER, J. Looistofscheikunde in de laatste 20 Jaar. *Chem. Weekblad* 24:359-366 (1924). 38 footnotes.
- DEKKER, J. Die Gerbstoffe. *In* Houben, *Meth. org. Chem.*, 3d Aufl., 3:961-1008 (1930). Bibl. footnotes.
- FREUDENBERG, KARL. Nachweis, Isolierung, Abbau- und Aufbaustudien auf dem Gebiete der Gerbstoffe. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 10:439-544 (1923). Bibl. footnotes.
- GRASSER, GEORG. Die künstlichen Gerbstoffe anorganischer und organischer Herkunft. *In* *grafes Handbuch der org. Warenkunde* 5, pt. 2:381-402 (1929). Bibl. footnotes.
- GRASSER, G. Künstliche Gerbstoffe. *In* Ullman, *Enzyk. tech. Chem.*, 2nd ed., 5:684-693 (1930). Bibl. through text; patents, p. 687-690; bibl., p. 693.
- GRASSER, GEORG. Kurzes Lehrbuch der Chromgerbung. Stuttgart, Enke, 1931. 222 p. Bibl. footnotes.
- IL'INSKII, M. A. Question of evolving a process for synthetic tanning. *J. Chem. Ind. (Moscow)* 8:577-581 (1931). 107 references.
- SANDOR, G. Kolloidchemie in der Gerberei. *Kolloid-Z.* 48:96-103 (1929). 77 footnotes.
- STIASNY, EDMUND. Gerbereichemie (Chromgerbung). Dresden, Steinkopff, 1931. 586 p. Bibl. footnotes.
- VLČEK, A. Les confits enzymatiques de tannerie et leur évaluation. *Cuir tech.* 19:20-25 (1930); *Gerber* 55:207-209, 219-221 (1929). 80 references.
- WILLIAMS, D. Extraction of raw tanning materials for analysis. *J. Am. Leather Chem. Assoc.* 26:420-431 (1931). Annotated.
- ZIMMERMANN, ALBRECHT. Die Gerbrinden liefernden Akazien (Wattle-Bäume), Kultur, Gewinnung, Verwendung und Handel. Jena, Fischer, 1930. 146 p. Bibl. p. 141-146. 223 references, 132 of which are in English.

TANTALUM

- HESS, FRANK L. Tantalum. *Mineral Resources of the U. S.*, 1927, 1:406-413. Bibl. footnotes and bibl., p. 412-413.
- IMPERIAL INSTITUTE. Mineral industry of the British Empire and foreign countries. Tantalum and niobium. London, The Institute, 1930. 27 p. Bibl., p. 25-27.
- MARKS, SYDNEY. Tantalum. *In* Friend, *Textbook Inorg. Chem.* 6, pt. III:117-133, 172-206 (1929). Bibl. footnotes.
- YOUNGMAN, E. P. Tantalum (and columbium). *U. S. Bur. Mines, Information Circ.* 6328. 1930. 37 p. 119 footnotes. Bibl., p. 37-38.

TAR.* *See* COAL TAR.**TARTARIC ACID.** *See* PLANTS: COMPOSITION.**TAURINE**

- MAHN, HERBERT. Taurin. *In* Abderhalden, *Biochem. Handl.* 12:598-602 (1930). Bibl. footnotes.

TAUTOMERISM

- SCHMIDT, JULIUS. Methoden zur Untersuchungen auf dem Gebiete der Tautomerie und Desmotropie. *In* Abderhalden, *Handb. biol. Arbeitsm.* 1, pt. 1:291-462 (1925). Bibl. footnotes.

TEETH

- DOWNS, WM. G. Experimental study of the growth effects of the anterior lobe of the hypophysis on the teeth and other tissues and organs. *J. Dental Research* 10:601-654 (1930). 209 references.
- KEMPF, GROVER A., and MCKAY, FREDERICK S. Mottled enamel in a segregated population. *Public Health Reports*, Reprint No. 1428. 1930. 18 p. Bibl., p. 16-18.
- KLEIN, HENRY. Critical analysis of the dental literature dealing with the effects of dietary variation upon the structure of teeth. *J. Dental Research* 9:5-9 (1929). Analysis of 97 papers.
- MCKAY, F. S. Bibliography of mottled enamel. *J. Dental Research* 10:566-568 (1930). 47 references.
- ROSEBURY, THEODOR. Biochemical study of the protein in dental enamel. *J. Dental Research* 10:212-213 (1930). 56 references.
- SMITH, GEOFFREY H. Factors affecting the deposition of dental calculus.

Australian J. Exptl. Biol. Med. Sci. 7: 76-77 (1930). 32 references.

Teeth, effect of chemical and physical agents; enamel of; teeth and diet. Index-Cat., S. G. O., 3rd ser., 10: 184-185, 185-186, 215 (1932).

TOVERUD, GUTTORM. Experimental studies on the physiological and pathological chemistry of the teeth, with special reference to the influence of calcium, vitamins and parathyroid glands. Thesis, Oslo, 1926. 145 p. Bibl., p. 136-139.

TELLURIDES *

MELLOR, J. W. Tellurides. *In his* Inorg. Theor. Chem. 11: 65-70 (1931).

TELLURIUM

MELLOR, J. W. Tellurium. *In his* Inorg. Theor. Chem. 11: 1-121 (1931). History 3-4; extraction, 10-11; physical properties, 22-25; chemical reactions, 31-32; atomic weights and valency, 35-36.

VALLANCE, R. H., TWISS, D. F., and RUSSELL, A. H. Tellurium. *In* Friend, Textbook Inorg. Chem. 7, pt. II: 350-391 (1931). Bibl. footnotes. Includes compounds.

TELLURIUM HALIDES *

MELLOR, J. W. Tellurium halides. *In his* Inorg. Theor. Chem. 11: 107-108, 109 (1931).

TELLURIUM OXIDES

MELLOR, J. W. Tellurium oxides. *In his* Inorg. Theor. Chem. 11: 76-77, 88 (1931).

TERPENES

RUZICKA, L. Ueber Konstitution und Zusammenhänge in der Sesquiterpenreihe. Fortschritte Chem., Physik, physik. Chem. 19A, No. 5. 1928. 56 p. Bibl. footnotes.

SIMONSEN, J. L. The terpenes. Vol. I. The simpler acyclic and monocyclic terpenes and their derivatives. Cambridge, Cambridge Univ. Press, 1931. 420 p. Extensive bibl. footnotes.

See also ESSENTIAL OILS, MENTHONE.

TETANY

FABRIS, S. La tetania nell'infanzia. *Pediatria Archivio* 2: 391-410 (1927).

GREENWALD, ISIDOR, and GROSS, JOSEPH. Prevention of the tetany of parathyroidectomized dogs. I. Cod liver oil. With a note on the effect of cod liver oil in calcium assimilation. *J. Biol. Chem.* 82: 529-530 (1929). 60 references.

TETRACHLOROETHYLENE *

LAMSON, P. D., ROBBINS, B. H., and WARD, C. B. The pharmacology and

toxicology of tetrachloroethylene. *Am. J. Hygiene* 9: 442-444 (1929). 36 references.

TETRATHIONIC ACID

MELLOR, J. W. Tetrathionic acid and the tetrathionates. *In his* Inorg. Theor. Chem. 10: 620 (1930).

TEXTILES

BLACKBURN, ENG., *Free Library, Museum and Art Gallery*. Catalogue of books on textiles and the textile industry. 1930. 46 p.

BRAY, HELEN A. Textile fibers, yarns and fabrics. New York, Century, 1929. 236 p. Bibl. at end of each part.

GIBBS, CHARLOTTE M. Household textiles. 3d ed. Boston, Barrows, 1930. 275 p. Bibl., p. 259-265.

GILONNE, GEORGES. Dictionnaire pratique des tissus. Lyon, Bosc frères & Riou, 1930. 550 p. Bibl., p. 541-546.

HEERMANN, P. Enzyklopädie der textilchemischen Technologie. Berlin, Springer, 1930. 969 p. Bibl. at head of chapters.

JOHNSON, ALVIN E. Government publications relating to textiles. U. S., Bureau of Foreign and Domestic Commerce, 1931. 3rd ed. 101 p.

JOVANOVITS, J., and GALLER, ST. Physikalisch-mechanische Prüfung der künstlichen Faserstoffe. First Comm. New Intern. Assoc. Testing Materials, Group C: 215-216 (1930). 68 references.

LEHNE, A. Textilchemische Erfindungen. Wittenberg, Ziensen Verlag. Parts 4-7 review German patents for 1928-1930.

PEARSON, HERBERT P. Das Wasserdichtmachen von Textilien. Dresden, Steinkopff, 1928. 74 p. Patents, p. 33-45.

PRESTON, J. M. Theory of luster. *J. Soc. Dyers Colourists* 47: 143 (1931). 26 references.

RAMSBOTTOM, J. E., and SNOAD, A. W. The fireproofing of fabrics. Dept. Sci. Ind. Res., Fabrics Coordinating Research Committee, 2nd Report, 1930. Bibl., p. 71. 35 references. Patents, p. 72-93.

SHINKLE, JOHN H. Elementary textile microscopy. New York, Howes Publ. Co., 1930. 144 p. Bibl., p. 135-136.

SOCIETY OF CHEMICAL INDUSTRY. Fibres, textiles, cellulose and paper. *In* Reports on the progress of applied chemistry 14: 133-154 (1929); 126 footnotes. 15: 145-169 (1930); 135 footnotes.

STAMPA, G. Present condition of industrial micro-biological retting of tex-

TEXTILES—Cont'd

tile plants. Monthly Bull. Agr. Sci. Practice 22: 72-74 (1931). 35 references.

THAYSEN, A. C., and BUNKER, H. J. Deterioration of fabrics by micro-organism. Dept. Sci. Ind. Res., Fabrics Co-ordinating Research Committee, 2nd Report, p. 178-180 (1930). 78 references.

See also BLEACHING, COTTON, DYEING, ENZYMES (Hesse), FIBERS, RAYON, SILK, WOOL.

THALLIUM

PRIBRAM, RICHARD. Thallium. In Doelter, Handb. Mineralchem. 3, pt. 2: 542-547 (1926). 62 footnotes.

THERAPEUTICS *

ANCHEL, DAVID. Recent advances in therapeutics. Am. J. Inst. Homeopathy 22: 617-621 (1929).

DAVIES, H. W. Therapeutic use of carbonic acid. Edinburgh Med. J. 36: 417-418 (1929). 67 references.

FLORENCE, GABRIEL. La thérapeutique moderne. Paris, Colin, 1930. 202 p. Bibl., p. 196-200.

HOFF, FERDINAND. Unspezifische Therapie und natürliche Abwehrvorgänge. Berlin, Springer, 1930. 123 p. Bibl., p. 115-123.

KÖNIG, F. Ueber Arzneiwirkung und Naturheilung. Berlin, Madaus & Co., 1928. 30 p. Bibl., p. 29-30.

MASSY, R. A. Atlas cedar (*Cedrus atlantica*) and the therapeutic products which it gives. Parfumerie moderne 22: 177-197 (1929). 62 references.

Therapeutics. Index-Cat., S. G. O., 3rd ser., 10: 278-287 (1932).

THERMAL CONDUCTIVITY

SMITH, C. S. Thermal conductivity of copper alloys. Am. Inst. Mining Met. Eng., Inst. Metals Div., Trans., 1930: 104-105. 37 references.

Thermal conductivity. In Tables Annuelles 7: 80-84 (1930); 8: 89-100 (1931). References through text.

THERMAL EXPANSION

Thermal expansion. In Tables Annuelles 7: 15-23 (1930); 8: 14-23 (1931). References through text.

THERMOCHEMISTRY

LANGE, ERICH. Ueber Lösungs- und Verdünnungswärmen einiger starken Elektrolyte. Fortschritte Chem., Physik, physik. Chem. 19, No. 6. 1928. 83 p. Bibl. footnotes.

MARSHALL, A. L. Thermochemistry. In Taylor, Treatise on Physical Chemistry, 2nd ed., 1: 283-351 (1931). Bibl. footnotes.

Thermochemistry and calorimetry. In Tables Annuelles 7: 137-162 (1930); bibls., p. 153-156, 161-162; 130 references. 8: 167-187 (1931); bibl. p. 183-187; 119 references.

THERMODYNAMICS

BOUTARIC, A. M. A. Thermodynamique et chimie. Paris, Hermann, 1926. 651 p. Bibl. footnotes.

BRUNOLD, CHARLES. L'entropie, son rôle dans le développement historique de la thermodynamique. Paris, Masson, 1930. 221 p. Bibl., p. 215-217.

HENNING, FRITZ. Anwendung der Thermodynamik. Berlin, Springer, 1926. 454 p. Contains bibls.

RANDALL, MERLE, and EPHRAIM, FRITZ. Free energy of chemical substances, activity coefficients, partial molal quantities and related constants. International Critical Tables VII: 346-353 (1930). 1563 references.

RANDALL, MERLE, NIELSEN, RALPH F., and WEST, GEORGE H. Free energy of some copper compounds. Ind. Eng. Chem. 23: 400 (1931). 102 references.

SIMON, F. Fünfundzwanzig Jahre Nernstscher Wärmesatz. Ergebnisse exakten Naturwissenschaften 9: 272-274 (1930). 123 references.

Thermodynamics. In Tables Annuelles 7: 95-136 (1930); 8: 110-166 (1931). References through text.

THIOGLUCOSIDES *

WREDE, FRITZ. Thio glykoside. In Oppenheimer, Fermente 3: 301-312 (1929). 32 footnotes.

THIONYL HALIDES *

MELLOR, J. W. The thionyl halides. In his Inorg. Theor. Chem. 10: 664-665 (1930).

THIOSULFATES *

MELLOR, J. W. The thiosulphates. In his Inorg. Theor. Chem. 10: 558-563 (1930).

THIOSULFURIC ACID

MELLOR, J. W. Thiosulphuric acid. In his Inorg. Theor. Chem. 10: 511-514 (1930).

SCHAEFFER, J., and BÖHM, F. Ueber den Zerfall der Thioschwefelsäure. Z. anorg. allgem. Chem. 183: 188 (1929).

THORIUM

Thorium. Index-Cat., S. G. O., 3rd ser., 10: 301-302 (1932). Includes therapeutic uses. See also MONAZITE.

THYMUS

HAMMETT, F. S. Die Physiologie des Thymus. Fortschritte Naturwiss.

- Forschung, N. F., No. 4. 1928. 22 p. Bibl. footnotes.
- LÖWENTHAL, KARL. Thymus. *In* Hirsch, Handb. inneren Sekretion 1: 851-866 (1926?).
- THOMAS, E. Physiologie des Thymus. *In* Hirsch, Handb. inneren Sekretion 2: 461-466 (1929).
- Thymus gland, extract of; physiology of. Index-Cat., S. G. O., 3rd ser., 10: 324-325, 326-327, 329-330 (1932).
- THYROID**
- ALLEN, BENNET M. Influence of the thyroid gland and hypophysis upon growth and development of amphibian larvae. *Quart. Rev. Biol.* 4: 349-352 (1929). 115 references.
- ASHER, LEON. Physiologie der Nebenschilddrüse. *In* Hirsch, Handb. inneren Sekretion 2: 273-275 (1929). 89 references.
- ASHER, LEON. Physiologie der Schilddrüse. *In* Hirsch, Handb. inneren Sekretion 2: 248-253 (1929). 259 references.
- BARR, D. P., and BULGER, H. A. Clinical syndrome of hyperparathyroidism. *Am. J. Med. Sci.* 179: 473-476 (1930). 118 references.
- BERBERICH, J., and BERNH., —. Schilddrüse und innere Sekretion. *In* Hirsch, Handb. inneren Sekretion 1: 415-431 (1926?).
- BULGER, H. A., DIXON, H. H., and BARR, D. P. Functional pathology of hyperparathyroidism. *J. Clinical Investigation* 9: 185-190 (1930). 83 references.
- CAMERON, A. T. Thyroid function. *Can. Med. Assoc. J.* 22: 245-246 (1930). 52 references.
- HAMMETT, FREDERICK S. Thyroid and growth. *Quart. Rev. Biol.* 4: 370-372 (1929). 82 references.
- KOWITZ, H. L. Die Funktion der Schilddrüse und die Methoden ihrer Prüfung. *Ergebnisse innere Medizin u. Kinderheilkunde* 27: 308-325 (1925).
- MAURER, ERNST. Schilddrüse, endemischer Kropf und Kretinismus. *In* Oppenheimer, Handb. Biochem., 2nd ed., *Ergänzungsband*: 309-351 (1930). 350 references.
- PERITZ, G., and ETTINGER, SOPHIE. Die Nebenschilddrüse. *In* Oppenheimer, Handb. Biochem., 2nd ed., 9: 386-434 (1927). 140 footnotes.
- Thyroid extract. Index-Cat., S. G. O., 3rd ser., 10: 332-334 (1932).
- Thyroid gland, chemistry of; internal secretions of. Index-Cat., S. G. O., 3rd ser., 10: 334-335, 336-337, 347-348 (1932).
- See also* PHARMACEUTICALS (Munch).
- THYROXIN***
- MAHN, HERBERT. Thyroxin. *In* Abderhalden, *Biochem. Handl.* 12: 663-685 (1930). Bibl. footnotes.
- See also* THYROID.
- TIN**
- MANTELL, CHARLES L. Tin; its mining, production, technology and applications. New York, Chem. Cat. Co., 1929. 366 p. Bibl. footnotes.
- MANTELL, C. L. Zinn. *In* Engelhardt, *Handbuch der technischen Elektrochemie*, I, pt. 1: 503-557 (1931). Patents, p. 517-519, 536, 542-545.
- WILHELM, CHARLES H. J. Die tinert-safzettingen van het eiland Singkep en de genese der alluviale afzettingen. Dissertation, Technische Hoogeschool, Delft, 1928. 126 p. Bibl., p. 121-126.
- TITANITE***
- OBERFÖLL, L. Ueber Titanit. *Neues Jahrb. Mineral. Geol.* 62: 381-383 (1931). 45 references.
- TITANIUM**
- BERTRAND, GABRIEL, and VORONCA-SPIRIT, C. Recherches sur la présence et la répartition du titane dans les plantes phanérogames. *Ann. sci. agron.* 46: 559-560 (1929).
- DRIGGS, F. H., and MARDEN, J. W. Titanium and zirconium. *Mineral Ind.* 37: 599-606 (1928). 18 footnotes on Ti; 21 footnotes on Zr.
- HESS, FRANK L. Titanium. *Mineral Resources of the U. S.*, 1927, I: 413-423. Bibl. footnotes and bibl., p. 416-423.
- YOUNGMAN, E. P. Deposits of titanium-bearing ores. *U. S. Bur. Mines, Information Circ.* 6386. 1930. 41 p. 144 footnotes. Bibl., p. 39-41.
- YOUNGMAN, E. P. Titanium. *U. S. Bur. Mines. Information Circ.* 6365. 1930. 39 p. 67 footnotes.
- TITANIUM DIOXIDE***
- VAN HOEK, C. P. Titandioxyd und Titanweiss. *Farben-Ztg.* 34: 2831-2832 (1929). 135 references.
- TOBACCO**
- EHRENSTEIN, MAX. Ueber die neuere Entwicklung der Chemie und Biochemie des Tabaks. *Arch. Pharm.* 268: 430-443 (1930). 38 footnotes.
- FLÜGLER, ADOLF. Tabakindustrie und Tabaksteuer. Jena, Fischer, 1931. 516 p. Bibl., p. 497-501.
- GARNER, W. W., *et al.* Rôle of chlorine in nutrition and growth of the tobacco plant and its effect on the quality of the cured leaf. *J. Agr. Research* 40: 646-648 (1930).

TOBACCO—Cont'd

KISSLING, R. Fortschritte auf dem Gebiete der Tabakchemie, sowie der Erzeugung, Verarbeitung und Verwendung des Tabaks. Fortschrittsber. Chem.-Ztg. 1930: 95-98. 147 footnotes.

Tobacco. Index-Cat., S. G. O., 3rd ser., 10: 380-382 (1932). Includes effects of and toxicology of tobacco.

VICKERY, H. B., and PUCHER, G. W. Chemical changes that occur during the curing of Connecticut shade-grown tobacco. Conn. Agr. Expt. Sta., Bull. 324: 240 (1931). 26 references.

VICKERY, HUBERT B., and PUCHER, GEO. W. Chemical investigations of tobacco. Conn. Agr. Expt. Sta., Bull. 311: 234-246 (1930). 24 references.

VICKERY, H. B., and PUCHER, G. W. Preliminary study of the non-volatile organic acids of tobacco leaves. Conn. Agr. Expt. Sta., Bull. 323: 200-202 (1931). 90 references.

TOURMALINE

KUNITZ, WILH. Die Mischungsreihen in der TurmalinGruppe und die genetischen Beziehungen zwischen Turmalinen und Glimmern. Chemie der Erde 4: 246-251 (1929).

TOXICOLOGY

FISCHER, HANS. Die physikalische Chemie in der gerichtlichen Medizin und in der Toxikologie. Zurich, Rudolf, 1925. 256 + xxxix p. Bibl. p. i-xxxix. Bibl. footnotes.

ITALIE, LEOPOLD VAN, and BIJLSMA, UBBE G. Toxicologie en gerechtelijke scheikunde. Amsterdam, Centen's, 1928 +. Bibl. footnotes.

STARKENSTEIN, EMIL, ROST, E., and POHL, J. Toxikologie, ein Lehrbuch für Aertze, Medizinalbeamte und Medizinstudierende. Berlin, Urban und Schwarzenberg, 1929. 531 p. Bibls. interspersed.

Toxicology. Index-Cat., S. G. O., 3rd ser., 10: 426-427 (1932).

TOXINS

DERNBY, K. G., and WALBUM, L. E. Studien über die Bildung des Diphtherietoxins. Biochem. Z. 139: 558-560 (1923).

POSSELT, ADOLF. Toxinaemia und Bacteriemia dysenterica. Ergebnisse allgem. Path. path. Anat. 22, pt. 2: 360-365 (1928). 112 references.

SCHLOSSBERGER, HANS. Antitoxins and Toxins. In Oppenheimer, Handb. Biochem., 2nd ed., 3: 116-151 (1925). 222 references.

STANDER, H. J. Toxemias of pregnancy. Medicine 8: 143-157 (1929).

Toxins and antitoxins. Index-Cat., S. G. O., 3rd ser., 10: 427 (1932).

WALBUM, L. E. Diphtherietoxin. Biochem. Z. 130: 67 (1922). 34 references.

WALBUM, L. E. Studien über die Bildung der bakteriellen Toxine. I. Staphylolysin. Biochem. Z. 129: 442-443 (1922). 47 references.

WELLS, H. G. Phytotoxins and zootoxins. In his Chemical Pathology, 5th ed., 134-156 (1925). 279 footnotes.

TRANSFORMER OILS

TYPKE, —. Ueber die Herstellung der Transformatoren- und Schalteröle. Petroleum 25: 819-824 (1929). 33 footnotes.

TRINITROBENZENE*

Le 1, 3, 5-trinitrobenzene ou benziite. Chimie et industrie 25: 17, 306 (1931). About 90 references.

TRIPHENYLMETHYL DERIVATIVES*

LIFSCHITZ, I. Ueber die Konstitution farbloser und farbiger Tritan-Derivate. Ber. 64B: 161-182 (1931). 66 footnotes.

TRYPSIN

Trypsin. Index-Cat., S. G. O., 3rd ser., 10: 478 (1932).

TRYPTOPHANE

DEMIANOWSKI, S. Zur Frage nach der Rolle des Tryptophans im tierischen Organismus. Biochem. Z. 193: 250 (1928). 28 references.

MAHN, HERBERT. Tryptophan. In Abderhalden, Biochem. Handl. 12: 693-717 (1930). Bibl. footnotes.

Tryptophane. Index-Cat., S. G. O., 3rd ser., 10: 479 (1932).

TUBERCLE BACILLUS

Tubercle bacillus, chemistry of; effects of chemical, organic and physical agents on. Index-Cat., S. G. O., 3rd ser., 10: 484, 486-487 (1932).

TUBERCULIN*

Tuberculin. Index-Cat., S. G. O., 3rd ser., 10: 496-499 (1932).

TUMORS

KAHN, HERBERT. Die Chemie der malignen Tumoren und die chemischen Veränderungen im krebserkrankten Organismus. Ergebnisse inneren Medizin u. Kinderheilkunde 25: 366-379 (1925).

WATERMAN, N. Der heutige Stand der chemotherapeutisch Carcinomforschung. Ergebnisse inneren Medizin u. Kinderheilkunde 3: 304-306 (1926).

WELLS, H. G. Chemistry of tumors. In his Chemical Pathology, 5th ed., 559-600 (1925). 389 footnotes.

See also CANCER.

TUNG OIL

SNELUS, S. M. Tung oil. Oil Color Chem. Assoc. J. 12: 113-153 (1929); J. Soc. Chem. Ind. 48: 854-855 (1929). 245 references, including 85 on the chemistry and 53 on the technology of tung oil.

TUNGSTATES *

DITTLER, E. Wolframate. In Doelter, Handb. Mineralchem. 4, pt. 2: 813-870 (1929). Bibl. footnotes.

MELLOR, J. W. Tungstates. In his Inorg. Theor. Chem. 11: 804-809, 812, 820-821, 827-828, 833, 837 (1931).

TUNGSTEN

ALTERTHUM, H. Wolfram als chemisch-technischer Werkstoff. Z. angew. Chem. 42: 313-314 (1929). 84 references.

FINK, COLIN G. Tungsten. Mineral Ind. 38: 647-648 (1929). Includes references on tungsten carbide. 39: 622-623 (1930). 19 references.

HESS, FRANK L. Tungsten. Mineral Resources of the U. S., 1927, I: 444-446. 1930, I: 201-207.

MELLOR, J. W. Tungsten. In his Inorg. Theor. Chem. 11: 673-874 (1931). History, p. 675; occurrence, p. 678-682; extraction, p. 687-689; preparation, p. 696-699; physical properties, p. 722-729; chemical properties, p. 736-738; atomic weight and valency, p. 740-741; alloys, p. 744-745. Bibliographies on various compounds through the text.

TUNGSTEN CHLORIDES

MELLOR, J. W. Tungsten chlorides and oxychlorides. In his Inorg. Theor. Chem. 11: 847-848, 853-854 (1931).

TUNGSTEN OXIDES

MELLOR, J. W. Tungsten oxides. In his Inorg. Theor. Chem. 11: 752-753, 760-762, 771-772 (1931).

TUNGSTITES *

DITTLER, E. Wolframit. In Doelter, Handb. Mineralchem. 4, pt. 2: 824-860 (1928). Bibl. footnotes.

TURQUOISE

AITKENS, I. Turquoise. U. S. Bur. Mines, Information Circ. 6491. 1931. 17 p. Bibl., p. 16-17.

TUTTON SALT *

HOFMANN, WILHELM. Die Struktur der Tuttonsche Salze. Z. Krist. 78: 332-333 (1931). 50 references.

TYRAMINE *

MAHN, HERBERT. Tyramin. In Abderhalden, Biochem. Handl. 12: 193-198 (1930). Bibl. footnotes.

TYROSINASE *

STAPP, C. Beiträge zum Studium der Bakterientyrosinase. Biochem. Z. 141: 69 (1923). 28 references.

See also OXIDASE (Woker).

TYROSINE

MAHN, HERBERT. Tyrosin. In Abderhalden, Biochem. Handl. 12: 618-663 (1930). Bibl. footnotes.

ULTRAFILTRATION

AUGSBERGER, ALEX. Beitrag zur Technik und Theorie der Ultrafiltration. Biochem. Z. 196: 288 (1928). 31 references.

ULTRAMARINE

HOFFMANN, J. Das Ultramarinproblem im Lichte neuerer Forschung. Chem.-Ztg. 53: 953-954, 974-975 (1929). 35 footnotes.

HOFFMANN, J. Ultramarine. Z. anorg. allgem. Chem. 183: 74-76 (1929). 53 references.

ULTRA-VIOLET LIGHT

AITKEN, R. Ultra-violet radiations and their uses. London, Oliver and Boyd, 1930. 208 p. Bibl., p. 192-198.

See also VITAMINS.

URANIUM. See RADIUM.**URANIUM MINERALS ***

KIRSCH, G., et al. Uranmineralien. In Doelter, Handbuch. Mineralchem. 4, pt. 2: 870-974 (1928). Bibl. footnotes.

UREA

BORDAS, JEAN, and MATHIEU, G. Evolution de l'urée dans le sol. Ann. sci. agron. 47: 726-727 (1930).

FOSSE, RICHARD. L'urée (recherches de chimie analytique, biologique et agricole). Les fonctions: dinaphtopyranol, xanthidrol et sel de pyryle (chimie organique). Paris, Les Presses Univ. France, 1928. 303 p. Bibl. footnotes.

KIESEL, A. Der Harnstoff im Haushalt der Pflanze und seine Beziehung zum Eiweiss. Ergebnisse Biol. 2: 304-310 (1927). 264 references.

LUBLIN, ALFRED. Die Ambardsche Harnstoffkonstante. Biochem. Z. 125: 200 (1921). 30 references.

MARGOSCHES, B. M., and ROSE, HEINRICH. Zur Deutung des Methodenfehlers der Harnstoff-Hypobromit-Methode. Biochem. Z. 137: 542-561 (1923). 55 footnotes.

SICKEL, HANS. Harnstoff und Derivate. In Abderhalden, Biochem. Handl. 12: 1-105 (1930). Numerous bibl. footnotes.

UREA—Cont'd

VAN SLYKE, D. D. Bestimmung von Harnstoff durch gasometrische Messung des durch die Einwirkung von Urease gebildeten Kohlendioxydes. *In* Abderhalden, Handb. biol. Arbeitsm. 4, pt. 1: 749-770 (1930). Bibl. footnotes.

See also BIOCHEMISTRY (Peters and Van Slyke).

UREASE

TAUBER, HENRY. Crystalline urease. *J. Am. Inst. Homeopathy* 24: 368 (1931). 15 references.

URIC ACID. See BIOCHEMISTRY (Peters and Van Slyke).

URINE

BANG, IVAR. Die Ursache für das Vorkommen von Arsen in normalen Harn. *Biochem. Z.* 165: 377-410 (1925). Bibl. footnotes.

BEECHER, ERWIN. Ueber Entstehung und Ablauf der Harnstoffdiurese. *Zentr. innere Med.* 45: 242-249, 273-284 (1924). 98 footnotes.

BRAHM, CARL. Der Harn. *In* Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, II: 446-449 (1929). 194 references.

DRABKIN, DAVID L. Normal pigment of the urine. III. A new method of its extraction. *J. Biol. Chem.* 88: 441-442 (1930). 31 references.

ENDRES, GUSTAV. Ueber Gesetzmäßigkeiten in der Beziehung zwischen der wahren Harnreaktion und der alveolaren CO₂-Spannung. *Biochem. Z.* 132: 241 (1922). 48 references.

GESENIUS, HEINRICH. Ausscheidung und Nachweis körperfremder Substanzen im Harn. *In* Abderhalden, Handb. biol. Arbeitsm. 4, pt. 5: 835-1064 (1931). Bibl. footnotes.

GODINHO, ANTONIO P. Ueber das Auftreten eines roten Farbstoffes nach Einnahme von reinem Chlorophyll. *Biochem. Z.* 155: 96 (1925). 30 references.

HÄRI, PAUL. Harn-Chemie. *In* Jahresber. Physiol. exptl. Pharmacol. 1: 229-240 (1920); 3: 278-301 (1922); 5: 372-398 (1924); 7: 588-606 (1926); 9: 568-583 (1928). Extensive bibl. footnotes.

Harn. *In* Jahresber. Physiol. exptl. Pharmacol. 1: 699-705; 2: 323-340; 3: 1013-1023; 4: 480-490; 5: 1320-1328; 6: 541-549; 7: 1446-1454; 8: 361-366; 9: 1231-1236; 10: 371-387 (1920-1929). Extensive bibl. for these years.

KAYE, GEOFFREY. Studies on the reaction of urine. *Australian J. Exptl. Biol. Med. Sci.* 6: 212-214 (1929). 39 references.

KICHIKAWA, W. Fortgesetzte Untersuchungen über den Einfluss der Nierenerven auf die Zusammensetzung des Harns. *Biochem. Z.* 166: 385 (1925). 43 references.

MAINZER, FRITZ, and JOFFE, ANNA. Zur Analyse des Säurebasengleichgewichts im Harn. *Biochem. Z.* 203: 86-87 (1928). 69 references.

MEYER, JOHANNES. Ueber die Ausfällung von Sedimenten und die Bildung von Konkrementen in den Harnwegen. *Z. klin. Med.* 111: 685-687 (1929).

MÖLLER, E., MCINTOSH, J. F., and VAN SLYKE, D. D. Relationship between urine volume and the rate of urea excretion by normal adults. *J. Clinical Investigation* 6: 463-465 (1928).

OTTENSTEIN, B. Harnkolloide und ihre Bestimmung nach der Goldzahlmethode. *Biochem. Z.* 128: 390 (1922). 21 references.

RONA, P., and KLEINMANN, H. Untersuchung des Harns. *In* Rona, Praktikum der physiol. Chemie 2: 295-676 (1929). Bibl. footnotes.

V. SAUER, H., and JARUSLAWSKY, W. Uebersichtsreferate über die deutsche urologische Literatur der Jahre 1928-1929. *Z. Urologie, Beiheft*, 1931. 79 p. Bibl., p. 62-79.

SPAETH, E. Fortschritte und Erfahrungen auf dem Gebiete der Untersuchungen und Beurteilung des Harns. *Arch. Pharm.* 266: 703-723 (1928). 100 footnotes. 267: 629-656 (1929). 124 footnotes. 268: 594-622 (1930). 123 footnotes.

TERWEN, A. J. L. Ueber Nachweis und Bestimmung von Urobilin und Urobilinogen. *In* Abderhalden, Handb. biol. Arbeitsm. 4, pt. 5: 663-678 (1930). Bibl. footnotes.

WEISE, WILHELM. Nachweis und Bestimmung des Zuckers in Harn. *In* Abderhalden, Handb. biol. Arbeitsm. 4, pt. 5: 679-764 (1930). Bibl. footnotes.

WEISS, M. Die Farbstoffanalyse des Harns. III. Das Urochrom. *Biochem. Z.* 133: 349 (1922). 20 references.

WEISS, M. Die Farbstoffanalyse des Harns. IV. Die Diazoreaktionen des Harns und die Beurteilung der Urochromogenausscheidung. *Biochem. Z.* 134: 291 (1922). 40 references.

WEISS, M. Die Farbstoffanalyse des Harns. V. Die Urochromogenausscheidung im gesunden und kranken

Organismus. *Biochem. Z.* 134: 587-588 (1923). 32 references.

U. S. GEOLOGICAL SURVEY *

ALBERTSON, GEORGE H. *Geologic index of the publications of the United States Geological Survey.* Denver, Geol. Publ. Co., 1931. 420 p.

VACUUM *

DUSHMAN, SAUL. Recent advances in the production and measurement of high vacua. *J. Franklin Inst.* 211: 689-750 (1931). 59 footnotes.

VALENCE

DARMOIS, E. Sur les théories de valence. *Bull. soc. chim.* 49: 329-360 (1931). 63 footnotes.

DUPONT, G. Sur la covalence. *Bull. soc. chim.* 49: 493-495 (1931). 90 references.

SUGDEN, SAMUEL. *The parachor and valency.* London, Routledge, 1930. 224 p. References for chapters viii and ix, p. 190.

VALINE

MAHN, HERBERT. Valin. In *Abderhalden, Biochem. Handl.* 12: 427-432 (1930). *Bibl. footnotes.*

VANADIUM

ALEXANDER, JEROME. Vanadium and some of its industrial applications. *J. Soc. Chem. Ind.* 48: 899-901 (1929). *Classified.*

MARKS, SYDNEY. Vanadium. In *Friend, Textbook Inorg. Chem.* 6, pt. 3: 9-116 (1929). *Bibl. footnotes.* Includes analysis, alloys and compounds. *See also RADIUM.*

Serial

Vancoram Review. 1 +. 1929 +. Contains abstracts of periodical and patent literature on vanadium.

VANILLIN

ULLRICH, ARTHUR. Die Herstellung von Vanillin aus Safrol oder Isosafrol. *Metallbörse* 19: 2225-2226, 2302-2303, 2359-2360 (1929); 20: 7, 62-63 (1930). *References through text.*

Vanillin. In *Wagner, Die Aldehyde*, 1930: 899-980. 400 footnotes.

VAPOR PRESSURE

Vapor pressures. Boiling points or sublimation points. In *Tables Annuelles* 7: 196-273 (1930); 8: 233-292 (1931). *References through text.*

VARNISHES

CAME, C. L. Durability tests of spar varnishes. *Bur. Standards J. Research* 4: 258-259 (1930).

FONROBERT, E. Künstliche Kopale als Rohstoffe moderner Lacke. *Farben-Ztg.* 35: 1661 (1930).

SCHIFFKORN, CARL. Die chemischen Vorgänge bei der Bildung und der Trocknung von Leinöllerlacken. *Chem. Umschau Fette, Oele, Wachse Harze* 38: 169-175 (1931). 54 footnotes.

WOLFF, H. Firnis. In *Ullmann, Enzyk. tech. Chem.*, 2nd ed., 5: 373-381 (1930). *Bibl.*, p. 381; *references through text.*

See also LACQUERS, PAINTS.

VENOMS

KRAUS, R., and WERNER, FR. Giftschlangen und die Serumbehandlung. *Jena, Fischer*, 1931. 220 p. *Bibl.*, p. 207-220.

Serpents, poisonous, venoms of. *Index-Cat.*, S. G. O., 3rd ser., 9: 561-562 (1931).

VERATRUM* *See PHARMACEUTICALS (Munch).*

VIBURUM *

YOUNGKEN, HEBER W. The pharmacognosy, chemistry and pharmacology of viburum. *J. Am. Pharm. Assoc.* 19: 703-704 (1930). 40 references.

VINEGAR

BITTING, A. W. A synopsis of patents pertaining to the manufacture of vinegar. *Fruit Products J. and Am. Vinegar Ind.* 8, no. 7: 25-27; no. 8: 16-18; no. 9: 13-15; no. 10: 18-20, 27; no. 11: 16-18; no. 12: 18-20; 9: 19-20, 25, 49-51, 86 (1929).

VISCOSE

DRÖSSEL, A. Neuere Arbeiten auf dem Gebiet der Viskoseforschung. *Tech. Chem. Papier- u. Zellstoff-Fabr.* 26: 78 (1929). 53 references.

HEUSER, EMIL, and SCHUSTER, MAX. Die wissenschaftlichen Grundlagen des Viskoseprozesses. *Cellulosechemie* 7: 17-55 (1926). 57 footnotes.

RASSOW, B., VOERSTER, T., and WOLF, L. Zur Kenntnis der Herstellung von Viskose aus Holzcellstoffen. *Papierfabr.* 28, no. 25A: 77-103 (1930). 62 footnotes.

SCHMIDT, HANNS. Die neuerne Entwicklung in der Viscose- und Viscoseseide-Herstellung. *Chem. Fabrik* 1931: 73-77, 85-90, 97-100. 52 footnotes. *Patents through text.*

See also RAYON.

VISCOSITY

BARR, GUY. *Monograph on viscometry.* London, Oxford Univ. Press, 1931. 318 p. *References at end of chapters.*

BINGHAM, EUGENE C. *Rheology index.* *J. Rheology* 2: 10-107 (1931). Many hundred references, alphabetically by author. *Subject index*, 2: 424-445 (1931).

VISCOSITY—Cont'd

ERK, —. Zähigkeit. In Landolt-Börnstein-Roth Tabellen, 1st suppl., 146-148 (1927); 2nd suppl., 146-147 (1931).

FAWKES, C. E. Selecting a viscometer an interesting problem. *Paint, Oil Chem. Rev.*, 88, no. 8: 12 (1929). 51 references.

GIORDANI, F. Viscosity of pure liquids. *International Critical Tables VII*: 224 (1930). 103 references.

HATSCHKE, EMIL. The viscosity of liquids. London, Bell, 1928. 239 p. Bibl. at end of chapters.

STAUDINGER, H. Viskositätsuntersuchungen an Molekül-Kolloiden. *Kolloid-Z.* 51: 71-89 (1930). 88 footnotes.

STAUDINGER, H., and SCHWEITZER, O. Ueber hochpolymere Verbindungen. 40. Viscositäts-Messungen an Polysacchariden und Polysaccharid-Derivaten. *Ber.* 63B: 2317-2330 (1930). 78 footnotes.

Viscosity. In *Tables Annuelles* 7: 43-59 (1930); 8: 56-67 (1931). References through text.

VITAMINS

BATCHELDER, ESTHER LORD. The effect of successive diminutions of vitamin A in the food on the nutrition and vitality of albino rats. Thesis, Columbia Univ., 1929. 35 p. Bibl. p. 34-35.

BEZSSONOFF, N. Deux remarques au sujet des réactions colorées des vitamines. *Bull. soc. chim. biol.* 11: 305-307 (1929). 37 references.

BLUNT, KATHARINE, and COWAN, RUTH. Ultraviolet light and vitamin D in nutrition. Chicago, Univ. Chicago Press, 1930. 229 p. Bibl. at end of each chapter.

BROWNING, ESTHER. The vitamins. London, Baillière, 1931. 575 p. Bibl., p. 432-523.

CHASE, ELANOR FRANCES. Quantitative study of the determination of the antineuritic vitamin (F or B₁). Thesis, Columbia Univ., 1929. 44 p. Bibl., p. 42-43.

CUMMINGS, M. J., and MATTILL, H. A. Auto-oxidation of fats with reference to their destructive effect on vitamin E. *J. Nutrition* 3: 432 (1931). 36 references.

DRUMMOND, J. C. Recent progress in the chemical study of the vitamins. *J. Soc. Chem. Ind.* 49: 1-10T (1930). 86 footnotes.

FALKENHEIM, CURT. Lichwirkung und antirachitischer Schutzstoff im le-

benden Organismus. *Jahrb. Kinderheilk., Suppl.* 19. 1928. 131 p. Bibl., p. 90-93.

FISHER, H. J., and BAILEY, E. M. Vitamin color reactions—a review of the literature. *J. Assoc. Official Agr. Chem.* 13: 360-363 (1930). 85 references.

FRANK, A. Die Bedeutung der Vitaminlehre mit besonderer Berücksichtigung der Kinderheilkunde. *Ergebnisse inneren Medizin u. Kinderheilkunde* 38: 513-582 (1931).

HETLER, R. A., et al. Vitamin-B and vitamin-G content of cereals. *Univ. Ill., Agr. Expt. Sta., Bull.* 369. 1931. Bibl., p. 210-211.

HOUDINIÈRE, ALBERT. L'avoine aplatie, la recherche des vitamines. Paris, Bossuet, 1929. 80 p. Bibl., p. 75-78.

HOYLE, J. C. The alleged toxic action of accessory food factors. *Lancet* 1929, I: 734-736. 55 references.

JOYET-LAVERGNE, PH. L'avitaminose B et la sexualisation cytoplasmique. *Protoplasma* 8: 462-466 (1930).

KING, E. J., and HALL, G. E. Hypervitaminosis. *Can. Med. Assoc. J.* 25: 543 (1931). 57 references.

KREITMAIR, H. Nachweis und Wertbestimmung von Hormonen und Vitaminen im Tierexperiment. *Ergebnisse Physiol.* 30: 202-208 (1930).

LACHAT, L. L. Carotin and vitamin A. *J. Chem. Education* 8: 881-883 (1931). 34 references.

LECOQ, RAOUL. Recherches expérimentales sur les vitamines B contenues dans les levures, dans leurs extraits et dans leurs milieux de culture. Paris, Vigot frères, 1928. 67 p. Bibl., p. 65-66.

MACLEOD, FLORENCE L. The chemistry of vitamin D. *J. Nutrition* 2: 529-530 (1930). 32 references.

RANDOIN, L., and LECOQ, R. Les vitamines hydrosolubles du groupe B. *Bull. soc. chim. biol.* 11: 767-775 (1929); *Rev. path. compar.* 29: 747-762 (1929). 121 references.

ROWNTREE, J. I. Absorption and retention of vitamin A in young children. *J. Nutrition* 3: 287 (1930). 38 references.

SCHPELEWSKAJA, N. E. Die Anwendung oberflächenaktiver vitaminfreier Stoffe bei der Avitaminose der Meerschweinchen. *Biochem. Z.* 204: 388 (1929). 35 references.

SCHNEUNERT, A., and SCHIEBLICH, M. Vitamine der Milch. In Winkler, *Handb. Milchwirtschaft* 1, pt. 1: 103-109 (1930).

- SCHIEBLICH, MARTIN. Vitamine. In Mangold, Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere, I: 260-265 (1929). 413 references.
- SCHWARTZ, E. W., MURPHY, F. J., and HANN, R. M. Destruction of vitamin C in the boiling of milk. *J. Nutrition* 2: 351-352 (1930). 27 references.
- SHERMAN, H. C. Nutritional significance of our present knowledge of the multiple nature of vitamin B. *J. Nutrition* 1: 198-199 (1928). 33 references.
- SHERMAN, H. C., and SMITH, S. L. The vitamins. 2nd ed. New York, Chem. Cat. Co., 1931. 525 p. Bibl., p. 351-533.
- STEENBOCK, H., and SCHRADER, I. M. Distribution of vitamin A in tomato and stability of added vitamin D. *J. Nutrition* 4: 279 (1931). 41 references.
- STEENBOCK, H., and WIRICK, A. M. Fat-soluble vitamins; butter fat, its antirachitic properties and its artificial activation. *J. Dairy Sci.* 13: 519-521 (1930). 30 references.
- SUDHOLT, HEINRICH. Die Ziegenmilchanämie als C-Avitaminose. *Z. Tierzücht, Züchtungsbiol. Tierernähr.* 14: 229-230 (1929). 63 references.
- SUNDERLIN, GERTRUDE, and WERKMAN, C. H. Synthesis of vitamin by microorganisms. *J. Bacteriology* 16: 32-33 (1928). 29 references.
- SUPPLEE, G. C., *et al.* The growth-promoting properties (vitamin B complex) of the concentrated water-soluble portion of milk. *J. Biol. Chem.* 93: 723-725 (1931). 44 references.
- SURE, BARNETT. Pathological changes in nursing young of the albino rat suffering from vitamin B deficiency and the rôle of vitamin B in infant nutrition. *Ark. Agr. Expt. Sta., Bull.* 252. 1930. 50 p. Bibl., p. 49-50. 53 references.
- SURE, BARNETT. The rôle of fat-soluble vitamins in fertility and nutrition. *Ark. Agr. Expt. Sta., Bull.* 250. 1930. 67 p. Bibl., p. 66-67. 80 references.
- SURE, BARNETT. The rôle of vitamin B in lactation and vitamin requirements of nursing young. *Ark. Agr. Expt. Sta., Bull.* 251. 1930. 62 p. Bibl., p. 62. 44 references.
- THATCHER, LEWIS. Hypervitaminosis-D. *Edinburgh Med. J.* 38: 466-467 (1931). 36 references.
- TILDEN, EVELYN B., and MILLER, EDGAR G., JR. Response of the monkey to withdrawal of vitamin A from the diet. *J. Nutrition* 3: 139-140 (1930). 50 references.
- TSCHERKES, L. A. Studien über B-Avitaminose. *Biochem. Z.* 167: 219-220 (1926). 64 references.
- TSCHERKES, L. A. Die Rolle der Proteine und Kohlehydrate bei Vitaminhunger. *Biochem. Z.* 133: 84 (1922). 35 references.
- TSUKIYE, SOGEN. Beiträge zur Kenntnis des Vitamins (B) nebst Darstellungsmethode. *Biochem. Z.* 131: 139 (1922). 40 references.
- Ultra-violet light and vitamins in poultry management. *Intern. Rev. Agr.*, pt. I, 20: 201-202 (1929). 28 references.
- See also ERGOSTEROL: IRRADIATED, PHARMACEUTICAL (Munch).
- ### VULCANIZATION
- ALADIN, —. Vulkanisationsbeschleuniger. *Gummi-Ztg.* 41: 2863-2865, 2923-2925, 2976-2978 (1927); 42: 246-247 (1927); 44: 2534-2535, 2577-2578; 45: 15-17, 67-68, 111-112, 114, 153-154 (1930). 472 patents.
- ALTPETER, J. Vulkanisationsbeschleuniger der Mercaptobenzothiazolreihe. *Metallbörse* 19: 2583, 2639 (1929). Patent review.
- BARAZZETT, A. La vulcanisation du caoutchouc et les théories de la vulcanisation. *Rev. gén. mat. plastiques* 6: 283-290, 323-333 (1930). References through the text.
- BOGGS, C. R., and BLAKE, J. T. Theory of vulcanization of rubber. *Ind. Eng. Chem.* 22: 754-755 (1930). 68 references.
- DITMAR, RUDOLF. Einige Verfahren zur Herstellung neuerer Vulkanisationsbeschleuniger. *Kolloid-Z.* 56: 248-251 (1931). Patent review.
- ELLEY, H. W., and POWERS, D. H. The guanidines as accelerators. *India Rubber World* 75: 143-144 (1926). 22 footnotes and 19 patents.
- STEVENS, W. H. The nature of vulcanization. *J. Soc. Chem. Ind.* 48: 60-62T (1929). 35 references.
- See also RUBBER.
- ### VULCANIZED FIBER
- SIMONS, F. L. Vulcanized fiber. *Cellulose* 1: 135-136 (1930). 27 references and about 55 patents.
- ### WALDEN INVERSION*
- BANCROFT, W. D., and DAVIS, H. L. Reagent concentration in the Walden inversion. *J. Phys. Chem.* 35: 1253-1269 (1931). 29 footnotes.
- KENYON, JOSEPH, and PHILLIPS, HENRY. Some recent developments in the study of the Walden inversion. *Trans. Faraday Soc.* 26: 451-458 (1930). 25 footnotes.

WALDEN INVERSION *—*Cont'd*

- NEBBELING, P. De omkeering volgens Walden. *Chem. Weekblad* 26: 462-469 (1929). 45 footnotes.

WATER

- BUTCHER, R. W., *et al.* Variations in composition of river waters. *Intern. Rev. ges. Hydrobiol. u. Hydrog.* 24: 69 (1930). 20 references.
- NAUMANN, EINAR. The scope and chief problems of regional limnology. *Intern. Rev. ges. Hydrobiol. u. Hydrog.* 22: 435-444 (1929). 170 references. Includes chemical factors.
- STEFFENS, W. Neuere Forschungsergebnisse auf den Gebiete der Wasserchemie. *Arch. Pharm.* 267: 145-158 (1929). 67 footnotes.

WATER: Analytical.

- ALSTERBERG, GUSTAF. Die Winklersche Bestimmungsmethode für in Wasser gelösten, elementaren Sauerstoff sowie ihre Anwendung bei Anwesenheit oxydierbarer Substanzen. *Biochem. Z.* 170: 74-75 (1926). 50 references.
- ANGERER, K. v. Die Methodik der bakteriologischen Wasseruntersuchung. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 11: 201-264 (1929). Bibl. footnotes.
- KLUT, HARTWIG. Untersuchung des Wassers an Ort und Stelle. 6. Aufl. Berlin, Springer, 1931. 180 p. Contains bibls.
- OLSZEWSKI, WO., and SPITTA, O. Untersuchung und Beurteilung des Wassers und des Abwassers. 5. Aufl. Berlin, Springer, 1931. 566 p. Bibls., p. 231-232, 379-393, 445-447, 500-505, 512.
- PALITZSCH, SVEN. Manual pratique de l'analyse de l'eau de mer. III. Determination des ions hydrogène par la méthode colorimétrique. *Bull. l'inst. océanographique*, No. 409. 1922. 31 p. Bibl., p. 26-28.
- POE, CHARLES F. Differential tests for the colon-aerogenes groups. *J. Am. Water Works Assoc.* 23: 1224-1226 (1931). 39 references.
- PRESCOTT, SAMUEL C., and WINSLOW, CHARLES E. A. Elements of water bacteriology, with special reference to sanitary water analysis. 5th ed. New York, Wiley, 1931. 219 p. Bibl., p. 177-208.
- SPLITTGERBER, A., and NOLTE, E. Untersuchungen des Wassers. *In* Abderhalden, *Handb. biol. Arbeitsm.* 4, pt. 5: 1-589 (1931). Bibl. footnotes; bibl. p. 1-3.

WATER: Biological*

- ADOLPH, EDWARD F. Living water. *Quart. Rev. Biol.* 5: 65-67 (1930). 68 references.
- CALDWELL, G. T. Water metabolism of the cat. *Physiol. Zool.* 4: 355-359 (1931).
- KAYSER, C. Contribution à l'étude du mécanisme nerveux de la régulation thermique. Régulation chimique et métabolisme de l'eau. *Ann. physiol. physicochim. biol.* 5: 233-243 (1929). 167 references.
- LINTZEL, W. Der Wasserhaushalt. *In* Mangold, *Handbuch der Ernährung und des Stoffwechsels der landwirtschaftlichen Nutztiere* 3: 364-365 (1931). 64 references.
- MAUTNER, —. Wasserbewegung im Organismus. *Monatsschr. Kinderheilk.* 41: 101-121 (1928).
- MOLITOR, HANS. Wasserhaushalt. *In* Jahresber. *Physiol. exptl. Pharmacol.* 7: 960-972 (1926). Bibl. footnotes.
- ROMINGER, E. Wasserverteilung und -bindung im Organismus. *Monatsschr. Kinderheilk.* 41: 75-77 (1928). 66 references.
- SCHADE, H. Wasserstoffwechsel. *In* Oppenheimer, *Handb. Biochem.*, 2nd ed., 8: 149-182 (1924). 123 footnotes.

WATER: Pollution.

- RUDOLFS, WILLIAM. *et al.* Studies on Raritan River pollution, 1927-1928. *N. J. Agr. Expt. Sta., Bull.* 489. 1929. 72 p. Bibl., p. 72. 35 references.

Serial

- Water Pollution Research—Summary of current literature. 3+. 1930+.

WATER: Purification.

- BACH, H. Fortschritte auf dem Gebiete der chemischen Wasseruntersuchung in den Jahren 1924-1928. *Vom Wasser* 3: 253-282 (1929). 171 footnotes.
- BACH, H. Die Trink- und Brauchwasserversorgung, 1924-1929. *Fortschrittsber. Chem.-Ztg.* 1931: 1-29. 682 references.
- BASCH, E. E. Literature on the use of permutit for water softening. *J. Gasbel.* 56: 859-862 (1913).
- KELLER, HERMANN. Wassergewinnung in heissen Ländern. Berlin, Ernst, 1929. 172 p. Bibl. footnotes.
- MARTIN, A. R. Water softening. The base-exchange or zeolite process. Summary of existing knowledge. *Dept. Sci. Ind. Research, Water Pollution Research, Tech. Paper No. 1.* London, 1929. 20 p. Bibl., p. 18-20. 52 references.

Real progress being made in treatment of water to prevent corrosion. *Water Works & Sewage* 78:220-221, 254 (1931). 49 references.

SHREVE, R. NORRIS. Greensand bibliography to 1930. With a chapter on zeolite water softening. Annotated. U. S. Bur. Mines, Bull. 328. 78 p.

SPLITTGERBER, A. Ueber den derzeitigen Stand der Kesselspeisewasserpflge mit besonderer Berücksichtigung der Speisung von Höchstdruckkesseln. *Vom Wasser* 2:92-127 (1928). 65 footnotes.

ULSAMER, OTTO. Die Chlorung des Trink- und Abwassers. *Ergebnisse Hygiene, Bakteriologie, Immunitätsforschung u. experim. Therapie* 8:714-725 (1926).

"Water purification by filtration." In Rubner, Grubner and Ficker, *Handbuch der Hygiene*, p. 181-185.

WHIPPLE, G. C. Disinfection as a means of water purification. *Proc. Am. Water Works Assoc.* 26:276-280 (1906). 58 references to water purification with ozone. Covers 1891-1906. See also SANITATION.

WATER SUPPLY*

GROSS, ERWIN. *Handbuch der Wasserversorgung*. 2. Aufl. Munich, Oldenbourg, 1930. 485 p. Bibl., p. 460-464.

TURNER, WM. D., and JACKSON, DANIEL D. Colloid factors in water supply. In Alexander, *Colloid Chemistry III*:154-156 (1931). 67 references.

WEED KILLERS*

MARTIN, HUBERT. The scientific principles of plant protection. New York, Longmans, 1928. 316 p. Bibls. through chapters.

WAHLENBERG, W. G. Investigations in weed control by zinc sulfate and other chemicals at the Savenac forest nursery. U. S. Dept. Agr., Tech. Bull. No. 156. 36 p. Bibl., p. 33-35. 42 references.

WETTING AGENTS*

TROTTER, S. R. Wetting agents. *Ind. Chemist* 4:201-204 (1928). Bibl. through text.

WETTING TENSION*

HALLER, W. Ueber die Benetzungsspannung. *Kolloid-Z.* 53:247-255 (1930). 88 footnotes.

WHEAT

GEDDES, W. F. Chemical and physico-chemical changes induced in wheat and wheat products by elevated temperatures. *Can. J. Research* 1:556-557 (1929). 31 references.

WINE

BLEYER, B., and DIEMAIR, W. Die Nachweis von Obstwein in Traubenwein. *Chem.-Ztg.* 53:621-622, 641-642 (1929). 29 footnotes.

SHAND, PHILIP M. A book of French wines. London, Knopf, 1928. 247 p. Bibl., p. 245-247.

WOOD

AMERICAN SOCIETY OF MECHANICAL ENGINEERS. *Woods of the world*. 80 p. 1930. 1500 references.

GIERISCH, WALTER. Beiträge zur Pentosanbestimmung in Holz. *Cellulosechemie* 6:61-74, 81-93 (1925). 110 footnotes.

HAWLEY, L. F. Wood-liquid relations. U. S. Dept. Agr., Tech. Bull. 248. 1931. 35 p. Bibl., p. 32-34.

HAYWARD, P. A. *Wood, lumber and timbers*. New York, Chandler Cyclopedica, 1930. 521 p. Bibl., p. 482-493, 499.

SCHWALBE, CARL G., and NEUMAN, K. E. Beiträge zur Kenntnis der jungen Rinde und des jungen Holzes von Fichte, Kiefer und Rotbuche. *Cellulosechemie* 11:113-128 (1930). 79 footnotes.

WOOD: Hydrolysis.*

BERGIUS, FREDRICH. Die Herstellung von Zucker aus Holz und ähnlichen Naturstoffe. In *Ergebnisse angew. physik. Chem.* 1:199-288 (1931). Bibl. footnotes.

WOOD PRESERVATION

BOULTON, H. A century of wood preservation. London, Allan, 1930. 150 p. Bibl., p. 115-123.

NOWOTNY, R. Neuere Bestrebungen und Erfahrungen in der Holzkonservierung. *Oester. Chem.-Ztg.* 31:216-219 (1929). 23 footnotes.

RHODES, F. H., and GARDNER, F. T. Comparative efficiencies of the components of creosote oil as preservatives for timber. *Ind. Eng. Chem.* 22:171 (1930). 36 references.

TRACY, LOUIS D., and TOLCH, N. A. Methods and costs of treating mine timber; what to treat and what life to expect. Pittsburgh, Carnegie Institute of Technology, 1927. Mining and Metallurgical Investigations, Bull. 33. 312 p. Bibl., p. 237-243.

U. S. NATIONAL COMMITTEE ON WOOD UTILIZATION. *Treated lumber; its uses and economies*. Washington, Govt. Print. Off., 1930. 42 p. Bibl., p. 39-42.

WOOL

KRONACHER, CARL, and LODEMANN, GEORG. *Technik der Haar- und Wolleuntersuchung*. Berlin, Urban and Schwarzenberg, 1930. 432 p. Bibl., p. 390-426.

MULLIN, C. E., and CADWELL, F. H. Artificial wools and wool-like finishes on fabrics; a review and discussion of the patents and literature. *Textile Colorist* 52: 161-164, 241-244 (1930).

TÄNZER, ERNST. Physikalisch-chemische Studien über die Feinbau des Wollhaares an unbehandelter Wolle. *Tierernähr. u. Tierzucht* 2: 744-747 (1931).

WILKINSON, H., and TYLER, A. G. Absorption of acids by wool. I. Summary of the literature. *J. Soc. Dyers Colourists* 44: 245 (1928). 42 references.

X-RAYS. See ROENTGEN RAYS.

YEAST

GENUAD, PAUL. Recherches sur les échanges d'ions entre cellules de levure et solutions salines. *Ann. physiol. physiochim. biol.* 6: 325-330 (1930).

LUNDIN, HARRY. Ueber den Einfluss des Sauerstoffs auf die assimilatorische und dissimilatorische Tätigkeit der Hefe. *Biochem. Z.* 141: 310-341 (1923). 47 footnotes. *Ibid.*, 142: 463-492 (1923). 62 footnotes.

NISSEN, W. Untersuchungen über das Vorkommen von Hefe in der Erde, mit besonderer Berücksichtigung der für die Milchwirtschaft wichtiger Arten. *Milchwirts. Forschung* 10: 65-66 (1930). 43 references.

SCHOELLER, W., and GEHRKE, M. Ueber die Beeinflussung der Glykolyse von lebenden Hefezellen. *Biochem. Z.* 172: 372 (1926). 25 references.

WILLIMOTT, S. G., and WOKES, F. Some constituents of dried yeast and yeast extracts. Their application in human nutrition. *Lancet* 1928, II: 668-673. 39 references.

See also FERMENTATION, VITAMINS.

ZEOLITES

BASCH, E. E. Literature on the use of permutit for water softening. *J. Gasbel.* 56: 859-862 (1913).

HEY, M. H. Studies on the zeolites. I. General review. *Mineral. Mag.* 22: 422-437 (1930). 93 references.

MARTIN, A. R. Water softening: the base-exchange or zeolite process. Summary of existing knowledge. London, H. M. Stationery Off., 1929. 20 p. Bibl., p. 18-20.

SHREVE, R. NORRIS. Greensand bibliography to 1930. With a chapter on zeolite water softening. Annotated. U. S. Bur. Mines, Bull. 328. 78 p.

ZINC

BABLIK, H. Grundlagen der Verzinkens. Berlin, Springer, 1930. 255 p. Bibl., p. 252-255. 167 references.

EGER, GEORG. Zink. In Engelhardt, Handbuch der technischen Elektrochemie, I, pt. 1: 454-458 (1931). 85 references and 161 patents.

IMPERIAL INSTITUTE. The mineral industry of the British Empire and foreign countries. Zinc. 2nd ed. (1920-1929). 1930. 193 p. Bibl., p. 165-193.

WEJNARTH, AXEL. Beiträge zur Kenntnis der elektrothermischen Zinkgewinnungsmethode. Stockholm, 1930. 146 p. Bibl. footnotes.

ZINC: Analytical.

FAIRHALL, L. T. Estimation of zinc in biologic material. *J. Ind. Hygiene* 8: 175-176 (1926).

ZINC: Biochemistry.*

DRINKER, K. R., and COLLIER, E. S. Significance of zinc in the living organism. *J. Ind. Hygiene* 8: 267-269 (1926).

LUTZ, R. E. Normal occurrence of zinc in biologic materials: a review of the literature, and a study of the normal distribution of zinc in the rat, cat and man. *J. Ind. Hygiene* 8: 205-207 (1926).

ZINC ALLOYS

ANDERSON, H. A. Zinc alloys for high- and low-temperature service. In Symposium on effect of temperature on the properties of metals (A. S. T. M.) 1931: 196-197. 32 references.

ZINC OXIDE

NEW JERSEY ZINC COMPANY. Zinc oxide as a rubber pigment. Research Bull., May, 1930. 32 p. Comprehensive bibl. of technical papers and U. S., British and German patents.

See also PAINT (Meier).

ZIRCONIUM

YOUNGMAN, E. P. Zirconium. II. Domestic and foreign deposits. U. S. Bur. Mines, Information Circ. 6456. 1931. 63 p. Mimeographed. 192 footnotes.

See also TITANIUM.

ZYMASE

WOKER, GERTRUD. Zymase. In her Die Katalyse. Biologische Katalysatoren, 1931: 1-200. Bibl. footnotes. Bibl., p. 155-163.

PERSONAL BIBLIOGRAPHIES

A. GENERAL

BUGGE, GUNTHER. Das Buch der grossen Chemiker. II. Von Liebig bis Arrhenius. Berlin, Verlag Chemie, 1930. 559 p. Biographical bibl. of general and specific sources of data regarding 68 chemists, vol. 2: 463-516.

B. SPECIAL

- ABERSON, JOHANNES HENDRIKUS. Chem. Weekblad 25: 584-585 (1928). 21 titles.
- AMADUZZI, LAVORO. Nuovo cimento 8: 1-6 (1931).
- AWENG, EUGÈNE, 1859-1929. J. pharm. Alsace-Lorraine 56: 188-192 (1929).
- BECKMANN, ERNST, 1853-1923. Ber. 61A: 125-130 (1928).
- BERTHELOT, MARCELLIN P. E., 1827-1907. In Cinquantenaire scientifique de M. Berthelot, 24 novembre 1901. Paris, 1902. Bibl., p. 181-182. In Centenaire de Marcelin Berthelot (Paris, 1929), p. 23-52. Chronological.
- BIEDERMANN, WILHELM, 1852-1929. Ergebnisse Physiol. 30: xxv-xxviii.
- BRAEMER, L. J. pharm. Alsace-Lorraine 55: 297-314 (1928).
- BRALY, ADRIEN, 1864-1927. Bull. soc. franç. mineral. 50: 460-463 (1927).
- BRAUNER, BOHUSLAV. Collection Czechoslovak Chem. Communications 2: 211-218 (1930).
- BREDIG, GEORG. Z. Elektrochem. 30: 349-350 (1930).
- COHEN, ERNST. Chem. Weekblad 24: 488-493 (1927). Lists articles from 1918 to 1927. Previous list in Chem. Weekblad 15: 1452 (1918).
- CUSHNY, ARTHUR R., 1866-1926. Arch. intern. pharmacodyn. thérapie 32: 6-8 (1926).
- DERRIEN, E., 1879-1931. Bull. soc. chim. biol. 13: 563-570 (1931). 111 titles.
- FANO, GIULIO, 1856-1930. Archiv. Fisiol. 29: viii-xv (1930).
- FRAŇEK, JAROMIR. Chem. Listy 24: 25-26 (1930).
- GLEY, E., 1857-1930. Arch. intern. pharmacodyn. thérapie 38: vii-xxx (1930). 524 titles.
- GOLDSCHMIDT, FRANZ, 1878-1926. Z. deut. Oel- u. Fett-Industrie 46: 626-627 (1926).
- GOLDSCHMIDT, HEINRICH. Z. Elektrochem. 30: 347 (1930).
- DE GRAMONT, A., 1861-1923. Bull. soc. franç. mineral. 50: 492-500 (1927).
- HENRY, AUGUSTINE, 1858-1930. Pharm. J. 124: 346 (1930).
- HEYMANS, J. F. -1930. Arch. intern. pharmacodyn. thérapie 38: xxxi-xxxv (1930).
- HISSINK, D. J. Chem. Weekblad 26: 582-586 (1929).
- IPATYEV, V. N. In Orlov, Summary of scientific investigations carried out by V. N. Ipatyev. Acad. Sci., Petrograd, 1927. 13 p.
- KEKULÉ, AUGUST. In Anschütz, August Kekulé. Berlin, Verlag Chemie, 1929. Bibl., v. 2: 953-960. 131 references.
- KOLTHOFF, I. M. Chem. Weekblad 24: 531-534 (1927).
- KORCZYŃSKI, ANTONI, 1879-1929. Roczniki Chem. 10: 211-220 (1930).
- KÜSTER, WILLIAM. 1863-1929. Ber. 64A: 32-36 (1931). 125 titles.
- LILIENFELD, LEON. Kunstseide 10: 401-407 (1928).
- LINCK, G. Chemie der Erde 5: 625-630 (1930).
- LORENZ, RICHARD, 1863-1929. Z. Elektrochem. 35: 817-822 (1929).
- LOTTERMOSER, A. Kolloid-Z. 52: 131-133 (1930).
- LYLALIN, L. M. Zhur. Prikladnoi Khim. 4: 161-167 (1931).
- MESTREZAT, WILLIAM, 1883-1928. Bull. soc. chim. biol. 11: 1070-1083 (1929). 208 titles.
- MILBAUER, JAROSLAV. Chem. Listy 24: 49-53 (1930). 96 references.
- Lo MONACO, DOMENICO, 1863-1930. Arch. farm. sper. 49: 361-365 (1930). 71 titles.
- MOSER, LUDWIG. Oesterr. Chem.-Ztg. 33: 190-191 (1930). 97 references.
- MOUREU, CHARLES, 1863-1929. Bull. soc. chim. 49: 801-825 (1931). 330 original papers listed.
- MYLIUS, FRANZ, 1854-1931. Ber. 64A: 167-194 (1931). 49 footnotes.
- OSBORNE, THOMAS B., 1859-1929. Conn. Agr. Expt. Sta., Bull. 312: 377-394 (1930).
- OST, HERMANN, 1852-1931. Cellulosechemie 12: 226 (1931). List of papers on carbohydrates.

- PAUL, THEODOR, 1862-1928. Ber. 62A: 7-11 (1929). Bibl. footnotes.
- PODKOPAIEV, N. I. Zhur. Prikladnoi Khim. 4: 157-160 (1931).
- RASCHIG, FRITZ, 1863-1928. Ber. 62A: 123-126 (1929).
- REEB, EMILE, 1843-1928. J. pharm. Alsace-Lorraine 56: 15-26 (1929).
- REVERDIN, FREDERIC, 1849-1931. Helv. Chim. Acta 14: 1060-1067 (1931). 132 references.
- RISLER, EUGÈNE, 1828-1905. Bull. soc. ind. Mulhouse 95: 209-216 (1929).
- SCHLOESING, A. TH., 1865-1930. Ann. agron. 1: 56-59 (1931).
- SILVERMAN, ALEXANDER, 1881- . Bull. Am. Ceram. Soc. 9: 217-220 (1930).
- SMITH, EDGAR FAHS, 1854-1928. Science 69: 557-565 (1929); Proc. Am. Chem. Soc. 51: 73-80 (1929). *See also* Memorial service for E. F. Smith, Univ. of Pa., Dec. 4, 1928. 62 p. Bibl., p. 51-59.
- SMITH, JAMES LORRAIN, 1862-1931. J. Path. Bact. 34: 693-696 (1931).
- SNYDER, HARRY. *In* Bread, p. 277-290. New York, Macmillan, 1930.
- STANĚK, VLADIMIR. Chem. Obzor 4: 97-101 (1929).
- VEITH, PAUL, 1849-1918. Milchwirt. Forschung 1: 232-244 (1924). 346 titles.
- DE VRIES, OTTO, 1881-1929. Chem. Weekblad 26: 193-194 (1929).
- WAGNER, ERNST. Physik. Z. 30: 281-290 (1929).
- WOLFF, LUDWIG, 1857-1919. Ber. 62A: 145-159 (1929). 60 footnotes.
- WOLFFENSTEIN, RICHARD. Z. angew. Chem. 42: 1151 (1929). 31 references.
- ZAWIDZKI, JAN. Przemysl Chem. 12: 553-560 (1928). 100 titles.
- ZHEMCHUZHNIU, S. F., 1873-1929. Zhur. Prikladnoi Khimii 3: 3-10 (1930). 49 titles.
- ZINCKE, THEODOR, 1843-1928. Ber. 62A: 17-45 (1929). 84 footnotes.

Q 11.N292 no50

3 9358 00016467 0

Q 11.N292 no50

3 9358 00016467 0